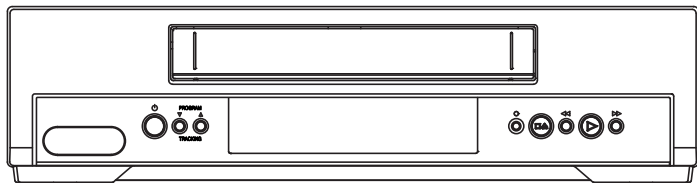


HITACHI

SERVICE MANUAL

No. 5302

VTFX340EUK
VTMX310EUK



SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

VIDEO CASSETTE RECORDER

May 2003 Digital Media Division

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1-1 IMPORTANT SAFETY PRECAUTIONS

1-1-1 Product Safety Notice

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by a ⚠ on schematics and in parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire, and/or other hazards. The Product's Safety is under review continuously and new instructions are issued whenever appropriate. Prior to shipment from the factory, our products are carefully inspected to confirm with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

1-1-2 Precautions during Servicing

- A. Parts identified by the ⚠ symbol are critical for safety. Replace only with part number specified.
- B. In addition to safety, other parts and assemblies are specified for conformance with regulations applying to spurious radiation. These must also be replaced only with specified replacements.
Examples: RF converters, RF cables, noise blocking capacitors, and noise blocking filters, etc.
- C. Use specified internal wiring. Note especially:
 - 1) Wires covered with PVC tubing
 - 2) Double insulated wires
 - 3) High voltage leads
- D. Use specified insulating materials for hazardous live parts. Note especially:
 - 1) Insulation tape
 - 2) PVC tubing
 - 3) Spacers
 - 4) Insulators for transistors
- E. When replacing AC primary side components (transformers, power cord, etc.), wrap ends of wires securely about the terminals before soldering.
- F. Observe that the wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.).
- G. Check that replaced wires do not contact sharp edges or pointed parts.
- H. When a power cord has been replaced, check that 5 - 6 kg of force in any direction will not loosen it.
- I. Also check areas surrounding repaired locations.
- J. Be careful that foreign objects (screws, solder droplets, etc.) do not remain inside the set.
- K. Crimp type wire connector
The power transformer uses crimp type connectors which connect the power cord and the primary side of the transformer. When replacing the transformer, follow these steps carefully and precisely to prevent shock hazards.
Replacement procedure
 - 1) Remove the old connector by cutting the wires at a point close to the connector.
Important: Do not re-use a connector. (Discard it.)
 - 2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.
 - 3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.
 - 4) Use a crimping tool to crimp the metal sleeve at its center. Be sure to crimp fully to the complete closure of the tool.
- L. When connecting or disconnecting the internal connectors, first, disconnect the AC plug from the AC outlet.

1-1-3 Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts, and wires have been returned to their original positions. Afterwards, do the following tests and confirm the specified values to verify compliance with safety standards.

1. Clearance Distance

When replacing primary circuit components, confirm specified clearance distance (d) and (d') between soldered terminals, and between terminals and surrounding metallic parts. (See Fig. 1-1-1)

Table 1-1-1 : Ratings for selected area

AC Line Voltage	Clearance Distance (d) (d')
230 V	$\geq 3 \text{ mm(d)}$ $\geq 6 \text{ mm(d')}$

Note: This table is unofficial and for reference only.
Be sure to confirm the precise values.

2. Leakage Current Test

Confirm the specified (or lower) leakage current between B (earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.) is lower than or equal to the specified value in the table below.

Measuring Method (Power ON) :

Insert load Z between B (earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across the terminals of load Z. See Fig. 1-1-2 and the following table.

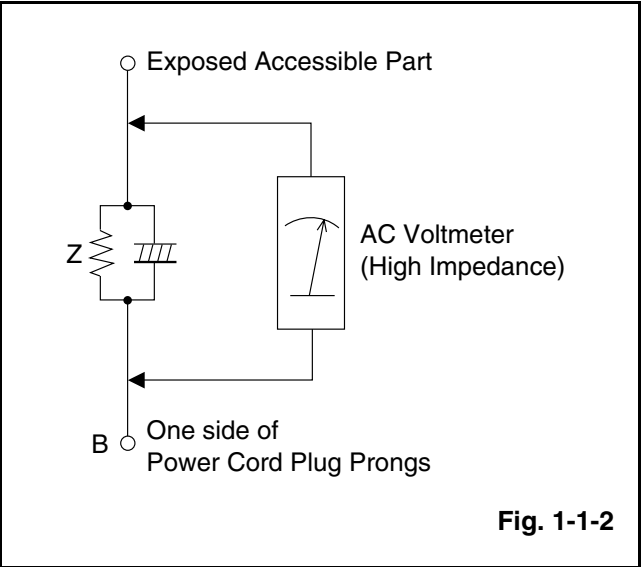
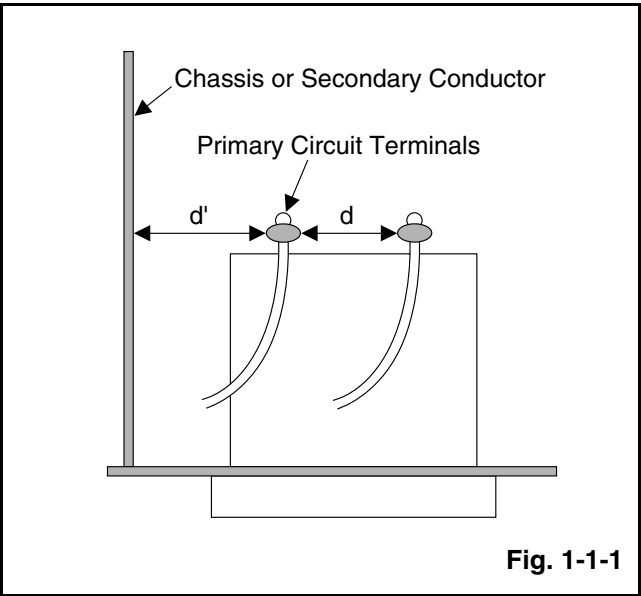


Table 1-1-2: Leakage current ratings for selected areas

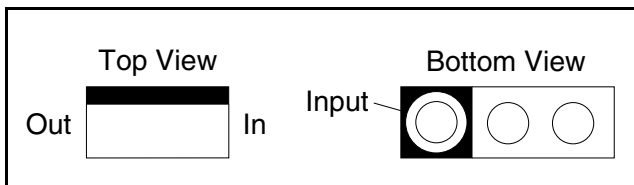
AC Line Voltage	Load Z	Leakage Current (i)	One side of power cord plug prongs (B) to:
230 V	2kΩ RES. Connected in parallel	$i \leq 0.7 \text{ mA AC Peak}$ $i \leq 2 \text{ mA DC}$	RF or Antenna terminals
	50kΩ RES. Connected in parallel	$i \leq 0.7 \text{ mA AC Peak}$ $i \leq 2 \text{ mA DC}$	A/V Input, Output

Note: This table is unofficial and for reference only. Be sure to confirm the precise values.

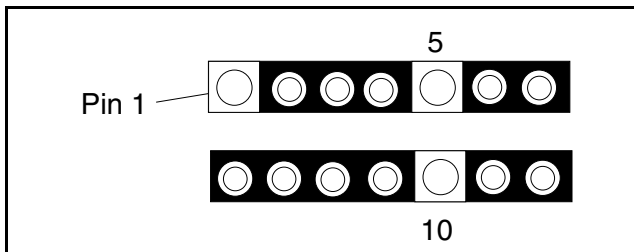
1-2 STANDARD NOTES FOR SERVICING

1-2-1 Circuit Board Indications

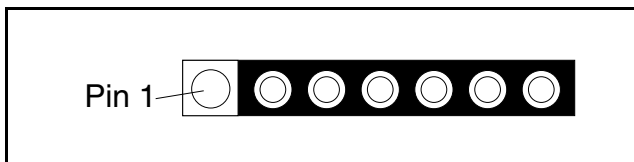
1. The output pin of the 3 pin Regulator ICs is indicated as shown.



2. For other ICs, pin 1 and every fifth pin are indicated as shown.

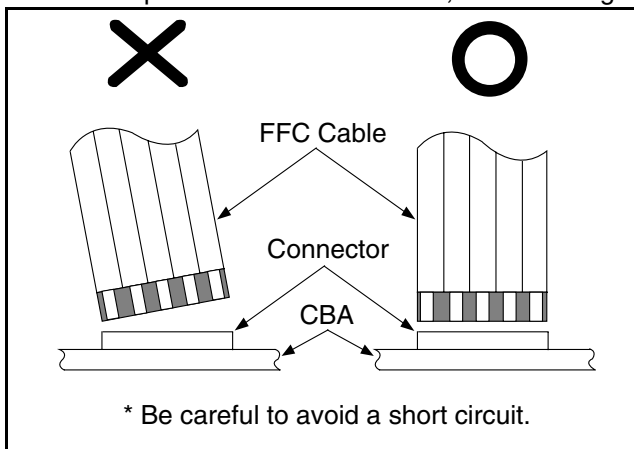


3. The 1st pin of every male connector is indicated as shown.



1-2-2 Instructions for Connectors

1. When you connect or disconnect the FFC (Flexible Foil Connector) cable, be sure to first disconnect the AC cord.
2. FFC (Flexible Foil Connector) cable should be inserted parallel into the connector, not at an angle.

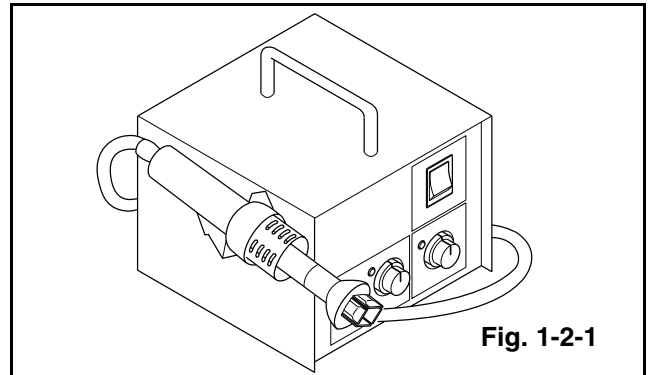


1-2-3 How to Remove / Install Flat Pack-IC

1. Removal

With Hot-Air Flat Pack-IC Desoldering Machine:

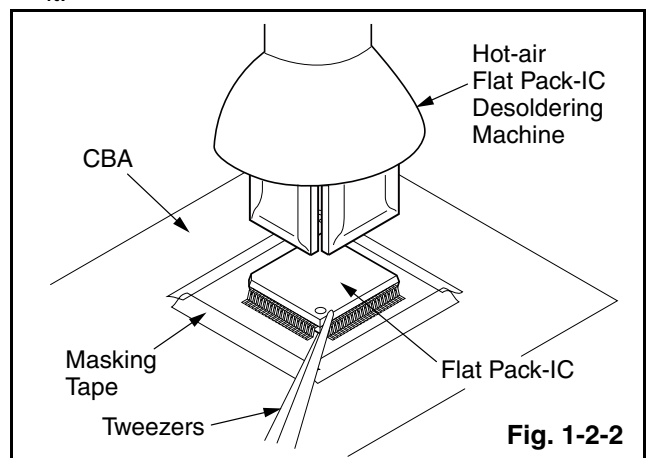
- (1) Prepare the hot-air flat pack-IC desoldering machine, then apply hot air to the Flat Pack-IC (about 5 to 6 seconds). (Fig. 1-2-1)



- (2) Remove the flat pack-IC with tweezers while applying the hot air.
- (3) Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. 1-2-6)
- (4) Release the flat pack-IC from the CBA using tweezers. (Fig. 1-2-6)

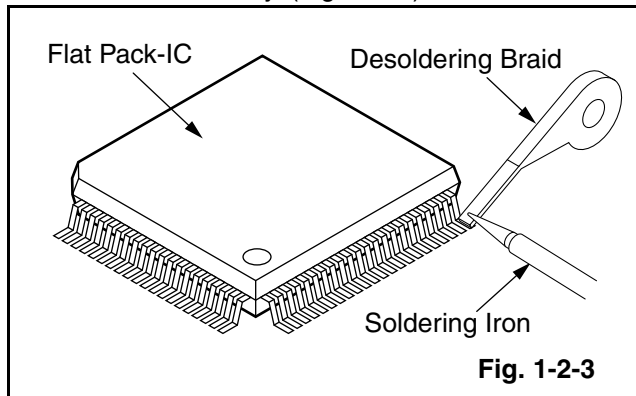
Caution:

1. Do not supply hot air to the chip parts around the flat pack-IC for over 6 seconds because damage to the chip parts may occur. Put masking tape around the flat pack-IC to protect other parts from damage. (Fig. 1-2-2)
2. The flat pack-IC on the CBA is affixed with glue, so be careful not to break or damage the foil of each pin or the solder lands under the IC when removing it.

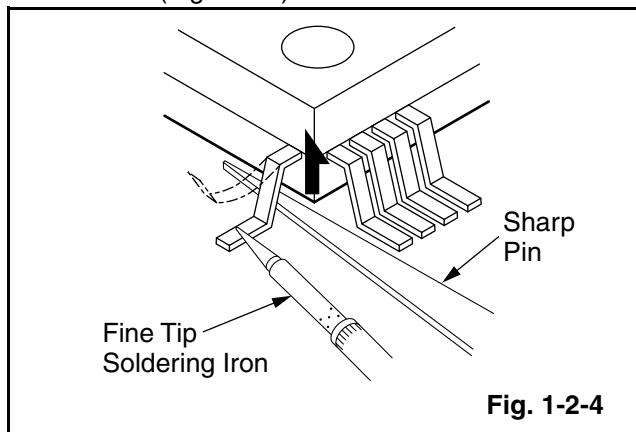


With Soldering Iron:

- (1) Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. 1-2-3)



- (2) Lift each lead of the flat pack-IC upward one by one, using a sharp pin or wire to which solder will not adhere (iron wire). When heating the pins, use a fine tip soldering iron or a hot air desoldering machine. (Fig. 1-2-4)



- (3) Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. 1-2-6)
- (4) Release the flat pack-IC from the CBA using tweezers. (Fig. 1-2-6)

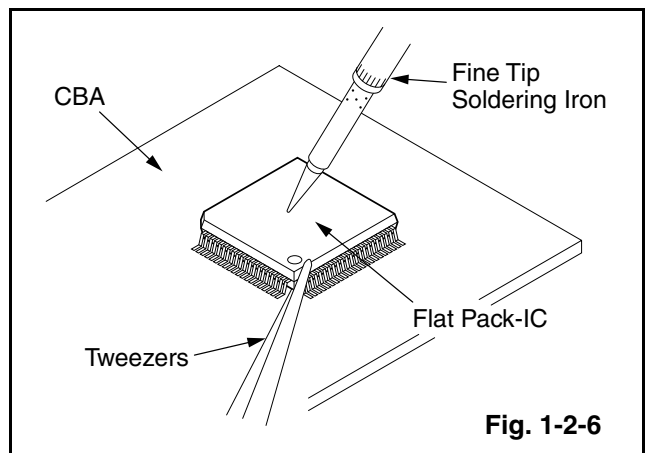
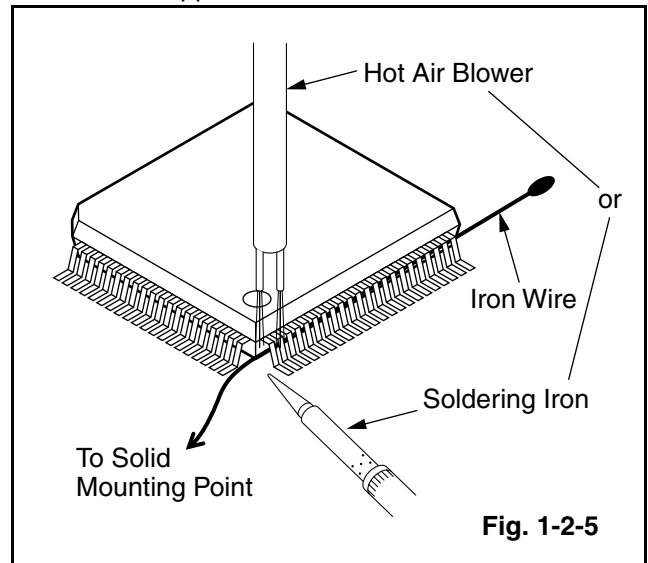
With Iron Wire:

- (1) Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. 1-2-3)
- (2) Affix the wire to a workbench or solid mounting point, as shown in Fig. 1-2-5.
- (3) While heating the pins using a fine tip soldering iron or hot air blower, pull up the wire as the solder melts so as to lift the IC leads from the CBA contact pads as shown in Fig. 1-2-5.

- (4) Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. 1-2-6)
- (5) Release the flat pack-IC from the CBA using tweezers. (Fig. 1-2-6)

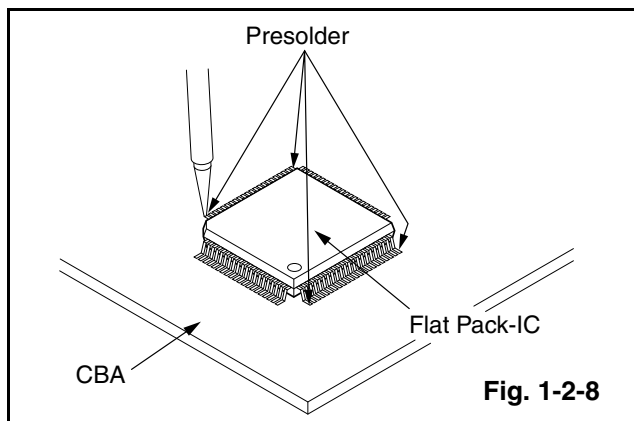
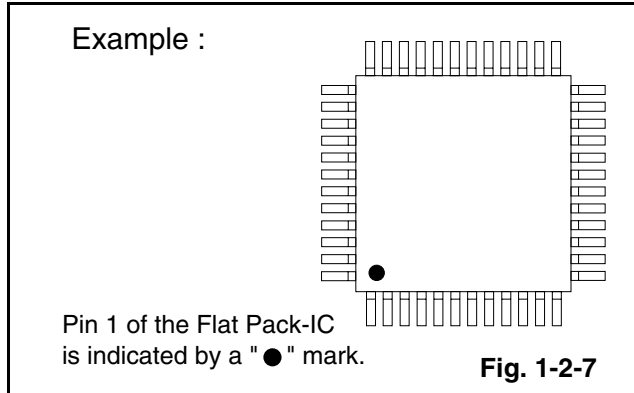
Note:

When using a soldering iron, care must be taken to ensure that the flat pack-IC is not being held by glue. When the flat pack-IC is removed from the CBA, handle it gently because it may be damaged if force is applied.



2. Installation

- (1) Using desoldering braid, remove the solder from the foil of each pin of the flat pack-IC on the CBA so you can install a replacement flat pack-IC more easily.
- (2) The "●" mark on the flat pack-IC indicates pin 1. (See Fig. 1-2-7.) Be sure this mark matches the 1 on the PCB when positioning for installation. Then presolder the four corners of the flat pack-IC. (See Fig. 1-2-8.)
- (3) Solder all pins of the flat pack-IC. Be sure that none of the pins have solder bridges.



1-2-4 Instructions for Handling Semi-conductors

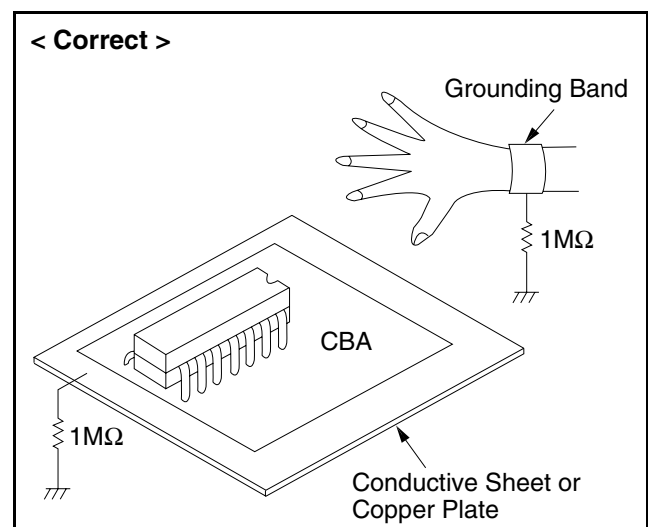
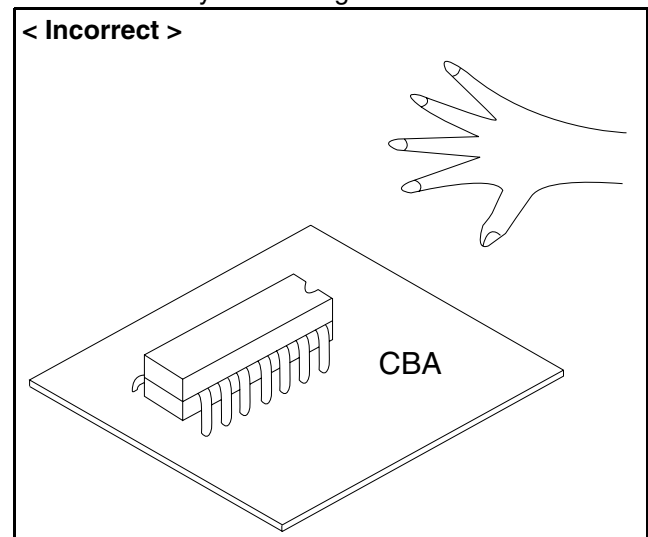
Electrostatic breakdown of the semi-conductors may occur due to a potential difference caused by electrostatic charge during unpacking or repair work.

1. Ground for Human Body

Be sure to wear a grounding band ($1M\Omega$) that is properly grounded to remove any static electricity that may be charged on the body.

2. Ground for Workbench

- (1) Be sure to place a conductive sheet or copper plate with proper grounding ($1M\Omega$) on the workbench or other surface, where the semi-conductors are to be placed. Because the static electricity charge on clothing will not escape through the body grounding band, be careful to avoid contacting semi-conductors with your clothing.



2-1 SPECIFICATIONS

[VT-FX340E(UK)]

General Specifications

Television system:	PAL I
Video heads	TV standard Six comprising of Four-video and Two-audio heads Helical scan system
Tape width :	12.65mm
Tape speed	
SP :	23.39mm/s
LP :	11.70mm/s
Tuner channel	IRA~IRJ E21~E69 CATV
RF converter :	Built-in UHF converter
Converter output :	UHF Channel 22 to 69 (adjustable)
Timer indication :	24-hour system
Operating temperature :	5°C ~ 40°C
Terminals	
AERIAL :	Coaxial type, male
RF OUT :	Coaxial type, female
AUDIO/VIDEO :	21 pin scart socket x 2

Electrical Specifications

Video output level :	1Vp-p
Video output impedance :	75Ω unbalanced
Audio output level :	-6dBV
Video input level :	0.5 ~2.0Vp-p
Audio input level :	-10dBV
Video S/N ratio (STANDARD):	45dB
Audio S/N ratio (STANDARD):	41dB

Other Specifications

Power requirement :	220-240V ~ 50Hz
Power consumption :	20 Watts (Stand by:3.3 watts)
Dimensions :	W 360mm H 92mm D 226mm
Weight :	2.6 Kg. (approx.)

[VT-MX310E(UK)]

General Specifications

Television system:	PAL I
Video heads	TV standard Rotary two-head helical scan system
Tape width :	12.65mm
Tape speed	
SP :	23.39mm/s
LP :	11.70mm/s
Tuner channel	IRA~IRJ E21~E69 CATV
RF converter :	Built-in UHF converter
Converter output :	UHF Channel 22 to 69 (adjustable)
Timer indication :	24-hour system
Operating temperature :	5°C ~ 40°C
Terminals	
AERIAL :	Coaxial type, male
RF OUT :	Coaxial type, female
AUDIO/VIDEO :	21 pin scart socket x 2

Electrical Specifications

Video output level :	1Vp-p
Video output impedance :	75Ω unbalanced
Audio output level :	-6dBV
Video input level :	0.5 ~2.0Vp-p
Audio input level :	-10dBV
Video S/N ratio (STANDARD):	45dB
Audio S/N ratio (STANDARD):	41dB

Other Specifications

Power requirement :	220-240V ~ 50Hz
Power consumption :	20 Watts (Stand by: 3.3 watts)
Dimensions :	W 360mm H 92mm D 226mm
Weight :	2.6 Kg. (approx.)

2-2 COMPARISON OF MODELS

2-2-1 Comparison of Features

←: Same as on left

ITEM		VT-FX340E(UK)/MX310E(UK)	VT-FX240EUK/MX210EUK
APPEARANCE	Cabinet Size	360(W) x 92(H) x 226(D) mm	←
	Weight	2.6 kg	←
	Power Consumption	20 W	←
VIDEO	Video Format	VHS	←
	Y/C Separation	Comb Filter	←
	YNR (Luminance Noise Reduction) Circuit	O	←
	New Synchronise Circuit	---	←
	Picture Control	O	←
INPUT/OUTPUT	Video/Audio Input (Rear)	2/2 (AV1/AV2)	←
	Video/Audio Input (Front)	---	←
	Video/Audio Output (Rear)	2/2 (AV1/AV2)	←
OTHER	Remote Controller	VT-RM340E [VT-FX340E(UK)] VT-RM310E [VT-MX310E(UK)]	VT-RM240E [VT-FX240EUK] VT-RM210E [VT-MX210EUK]
	Stereo CM Skip Feature	---	←
	Auto Clock Feature	O	←
	Number of Timer Programming	8 Program/year	←
	Self Diagnosis Function	O (4 Modes)	←
	Back-up Time	60 s	←
	SQPB	---	←
	Surge Absorber	---	←
	Auto Power Off Feature	O	←
	Local Broadcast Setting	O	←
	Multi Search Feature	O (Index, Time Search, Quick Find)	←
MECHANISM	Search Speed	SP: X5/X7 LP: X5/X11	←
	FF/REW Time (T-120 Tape)	FF: approx. 100 s, REW: approx. 100 s	←
	Head Composition [VT-FX340E(UK)] / [VT-FX240EUK]	DA4+Hi-Fi SP: 2[49/49 µm] LP: 2[25/25 µm] Hi-Fi Audio: 2[28/28 µm]	←
	Head Composition [VT-MX310E(UK)] / [VT-MX210EUK]	DA2 28/28 µm	←
	Head Material [VT-FX340E(UK)] / [VT-FX240EUK]	SP: Ferrite LP: Ferrite Hi-Fi Audio: Ferrite	←
	Head Material [VT-MX310E(UK)] / [VT-MX210EUK]	SP: Ferrite LP: Ferrite	←
	VISS	O (Index Search)	←
	PULSE	Flame by Flame Mode [VT-FX340E(UK)] Tracking Mode [VT-MX310E(UK)]	Flame by Flame Mode [VT-FX240EUK] Tracking Mode [VT-MX210EUK]

2-2-2 Comparison of Main Control ICs

←: Same as on left

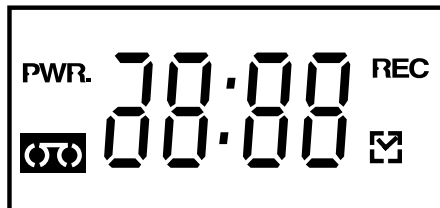
ITEM	OPERATION	VT-FX340E(UK)/MX310E(UK)	VT-FX240EUK/MX210EUK
Video	Video Signal Process	LA71750AM-MTB(IC301)	←
Audio	FM Audio Signal Process	LA72648M(IC451) [VT-FX340E(UK)]	LA72646M-A-MPB(IC451) [VT-FX240EUK]
	Linear Audio Signal Process	Included in IC301	←
System Control	Main Microcomputer μ P	M37762MCA-AC8GP(IC501)	M37762MCA-1C1GP(IC501)
	VCR-EEP ROM	BR24C02F-W(IC503)	←
	Reset	-	-
	Loading Motor Drive	-	-
	Cylinder/Loading Motor Control	-	-
	Power Reset	-	-
	VPS	LC74793JM-TRM(IC640)	-
	Audio Output Selector	TC4052BF(EL)(IC151) [VT-MX310E(UK)]	TC4052BF(EL)(IC151) [VT-MX210EUK]
Timer	Display Driver	PT6958-FN-TP(IC571)	←
Power	Switching Driver	-	-

2-3 FUNCTION INDICATOR SYMBOLS

Note:

The following symbols will appear on the indicator panel to indicate the current mode or operation of the VCR.
On-screen modes will also be momentarily displayed on the tv screen when you press the operation buttons.

Display panel



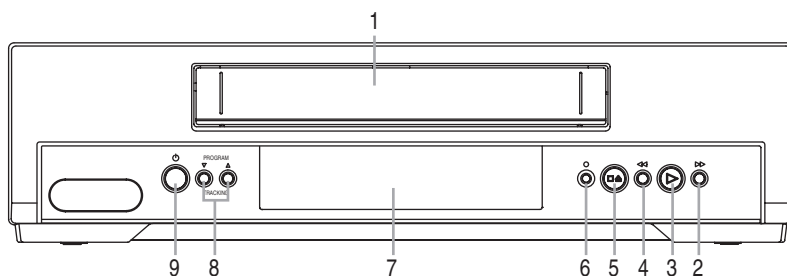
" H " = LED Light on, " L " = LED Light off

LED MODE	INDICATOR ACTIVE	
CASSETTE "IN"	"  "	ON
CASSETTE "OUT"	"  "	OFF
CLOCK	" 88:88 "	ON
POWER ON	" PWR. "	ON
REC	" REC "	ON
REC PAUSE	" REC "	Blinks at 0.8Hz interval
T-REC,OTR	"  "	ON (T-REC OFF,T-REC incomplete Blinks at 0.8Hz interval)
When reel and capstan mechanism is not functioning correctly	"  " " 1 "	Blinks at 0.8Hz interval
When tape loading mechanism is not functioning correctly	"  " " 2 "	Blinks at 0.8Hz interval
When cassette loading mechanism is not functioning correctly	"  " " 3 "	Blinks at 0.8Hz interval
When the drum is not working properly	"  " " 4 "	Blinks at 0.8Hz interval
P-ON Power safety detection	"  " " 5 "	Blinks at 0.8Hz interval
S-INH condition	All modes	Blinks at 0.8Hz interval

2-4 OPERATING CONTROLS AND FUNCTIONS

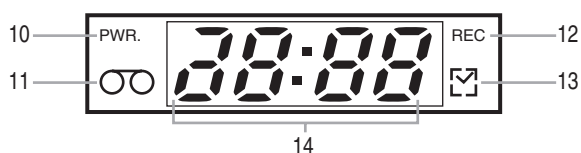
[VT-FX340E(UK)]

Front Panel



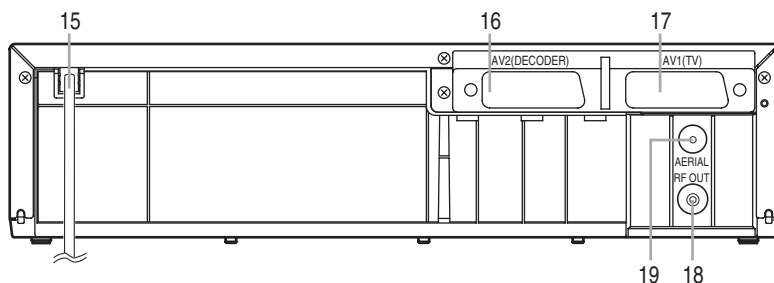
1. Cassette compartment
2. ►► (F.FWD) button
3. ► (PLAY) button
4. ◀◀ (REW) button
5. ■▲ (STOP/EJECT) button
6. ● (REC) button
7. Indicator (See below)
8. PROGRAM (▲/▼) [TRACKING] buttons
9. ○ (OPERATE) button

Indicator



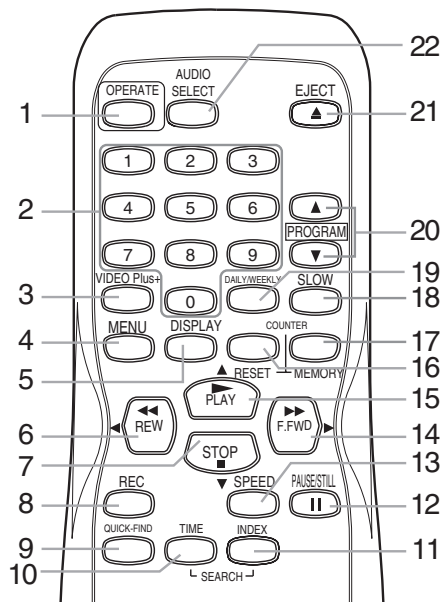
10. PWR. (Power) indicator
11. TAPE IN indicator
12. REC indicator
13. ⏏ (Timer) indicator
14. CLOCK indicator

Rear Panel



15. Power cord
16. AV2 (DECODER) socket
17. AV1 (TV) socket
18. RF OUT socket
19. AERIAL socket

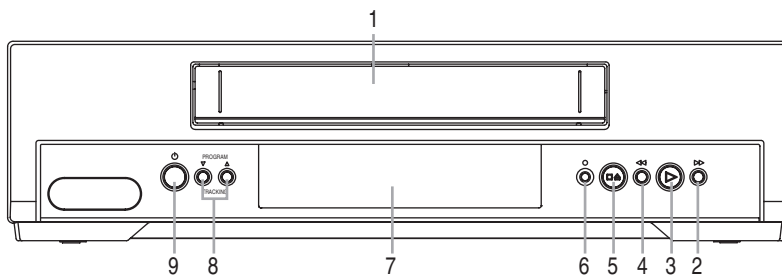
Remote Control



1. OPERATE button
2. NUMBER buttons
3. VIDEO Plus+ button
4. MENU button
5. DISPLAY button
6. REW/◀ button
7. STOP/▼ button
8. REC button
9. QUICK-FIND button
10. TIME SEARCH button
11. INDEX SEARCH button
12. PAUSE/STILL button
13. SPEED button
14. F.FWD/► button
15. PLAY/▲ button
16. COUNTER RESET button
17. COUNTER MEMORY button
18. SLOW button
19. DAILY/WEEKLY button
20. PROGRAM (▲/▼) buttons
21. EJECT button
22. AUDIO SELECT button

[VT-MX310E(UK)]

Front Panel



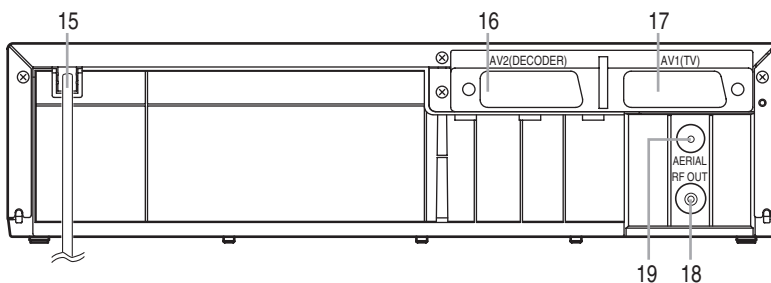
1. Cassette compartment
2. ►► (F.FWD) button
3. ► (PLAY) button
4. ◀◀ (REW) button
5. ■▲ (STOP/EJECT) button
6. ● (REC) button
7. Indicator (See below)
8. PROGRAM (▲/▼) [TRACKING] buttons
9. ○ (OPERATE) button

Indicator



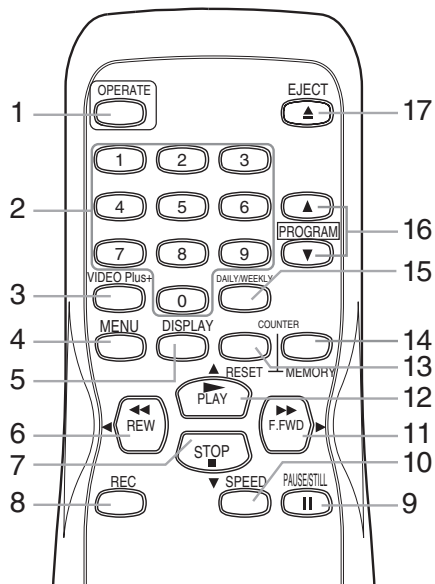
10. PWR. (Power) indicator
11. TAPE IN indicator
12. REC indicator
13. ⏰ (Timer) indicator
14. CLOCK indicator

Rear Panel



15. Power cord
16. AV2 (DECODER) socket
17. AV1 (TV) socket
18. RF OUT socket
19. AERIAL socket

Remote Control

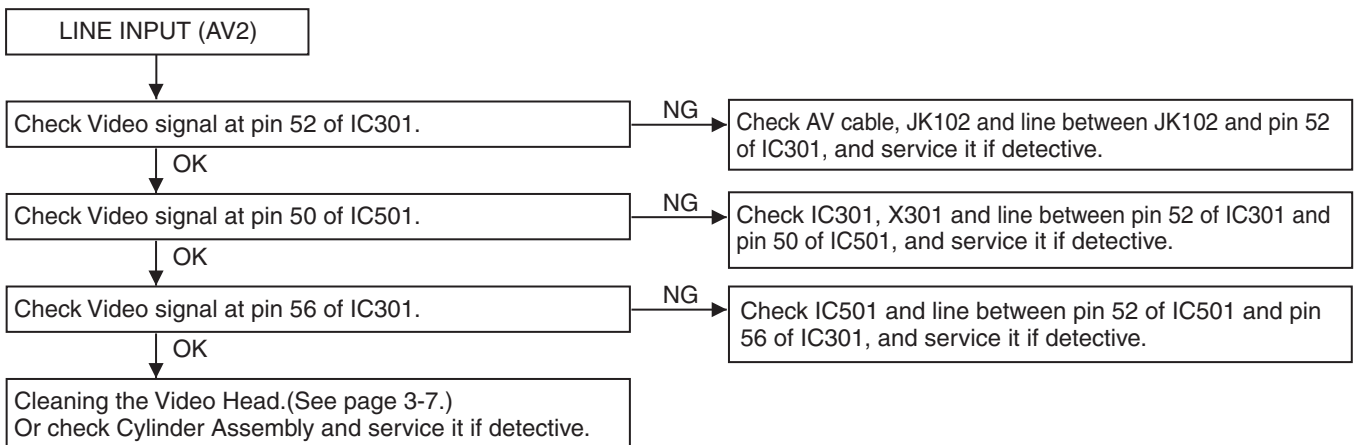
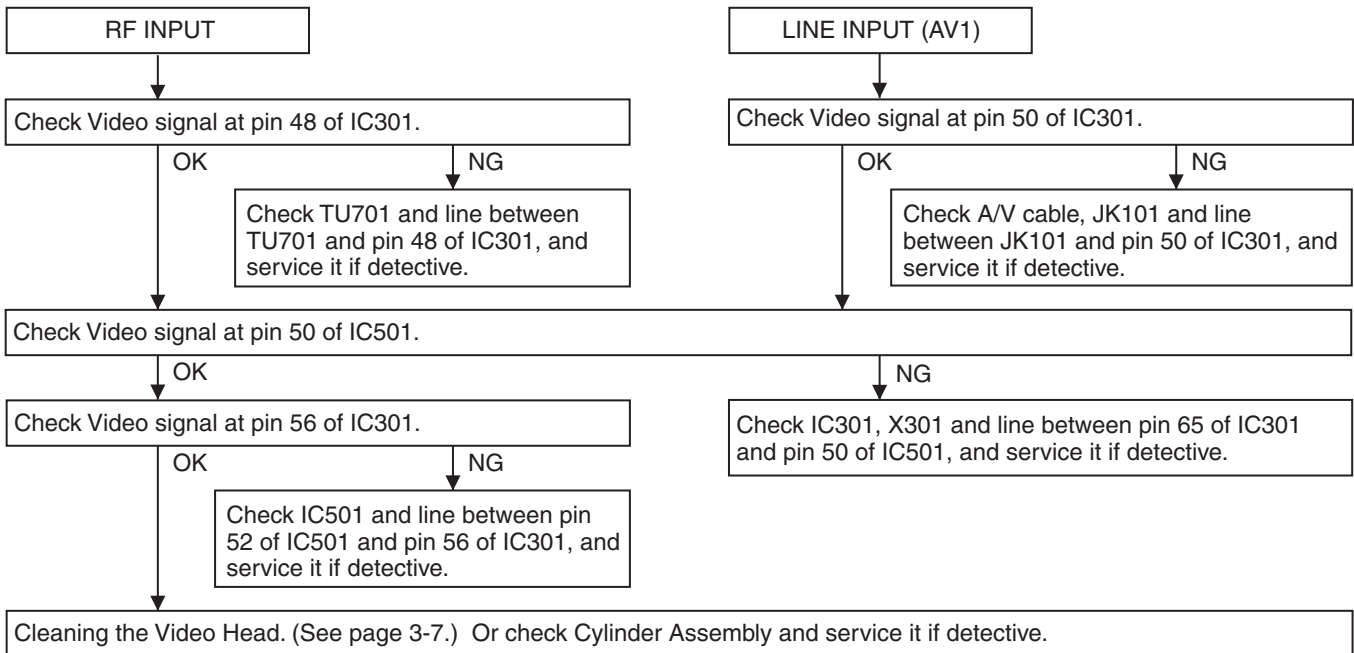


1. OPERATE button
2. NUMBER buttons
3. VIDEO Plus+ button
4. MENU button
5. DISPLAY button
6. REW/◀ button
7. STOP/▼ button
8. REC button
9. PAUSE/STILL button
10. SPEED button
11. F.FWD/► button
12. PLAY/▲ button
13. COUNTER RESET button
14. COUNTER MEMORY button
15. DAILY/WEEKLY button
16. PROGRAM (▲/▼) buttons
17. EJECT button

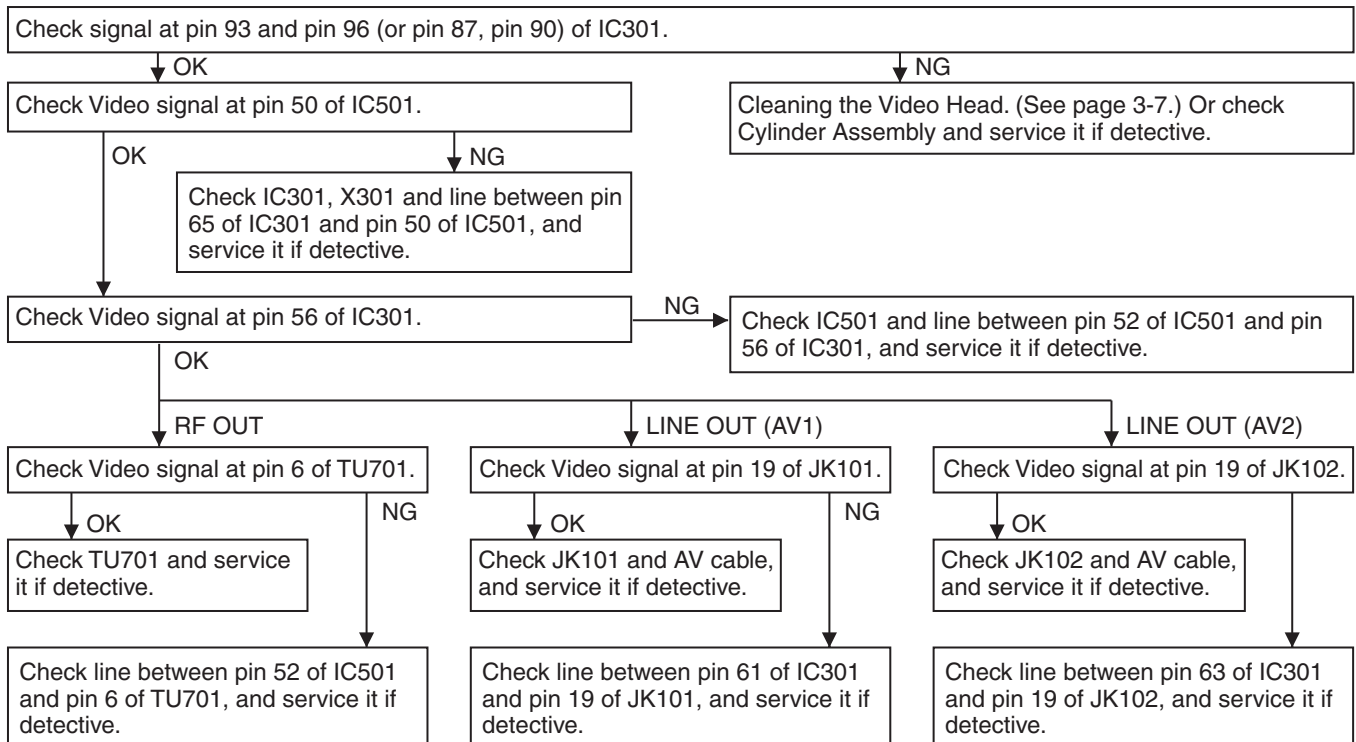
3-1 TROUBLESHOOTING

Troubleshooting is how to service for the specifying malfunction or poor parts.
Detect malfunction or poor parts and service as the following charts.

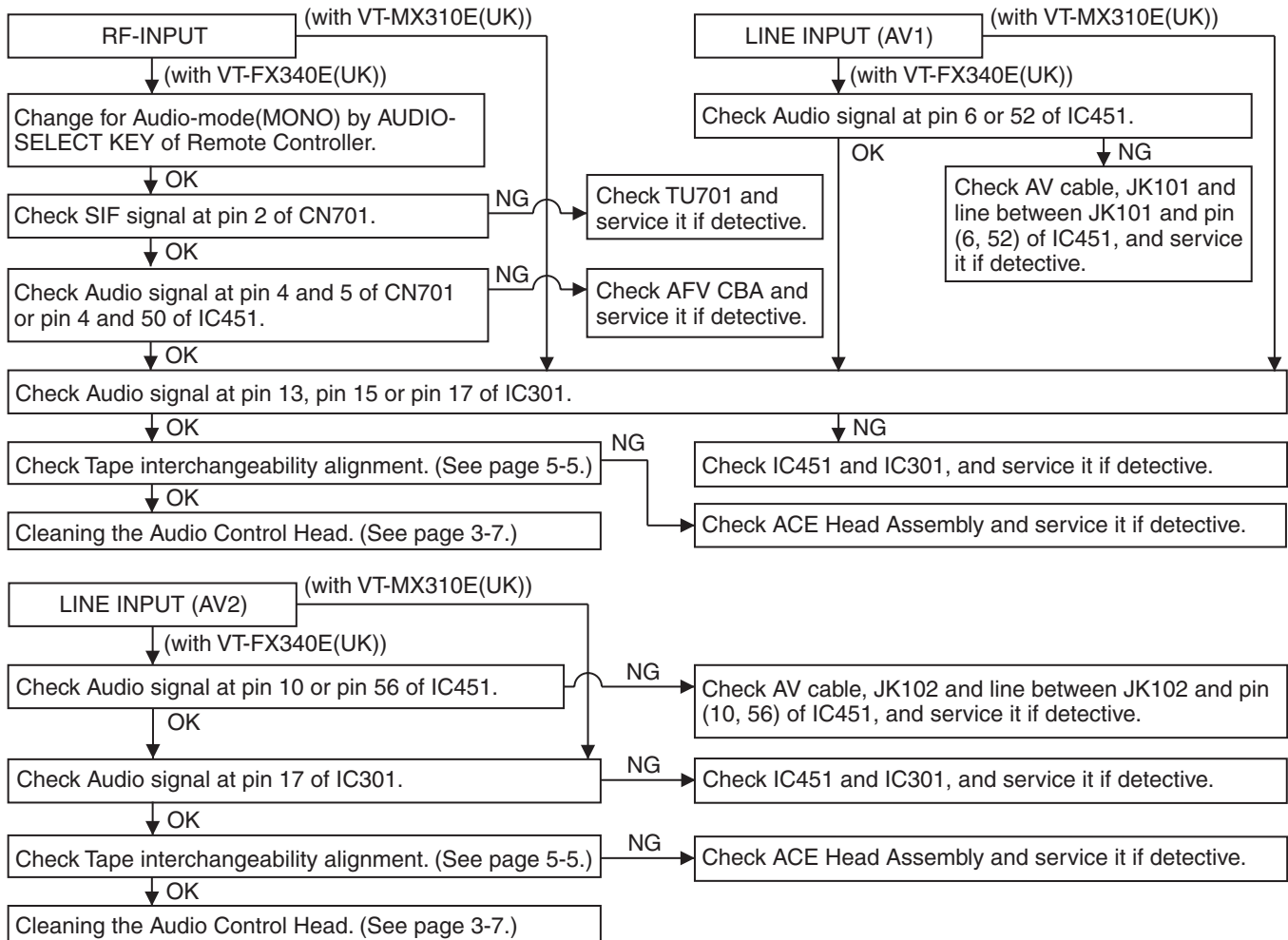
Video problem 1 (No recording Video)



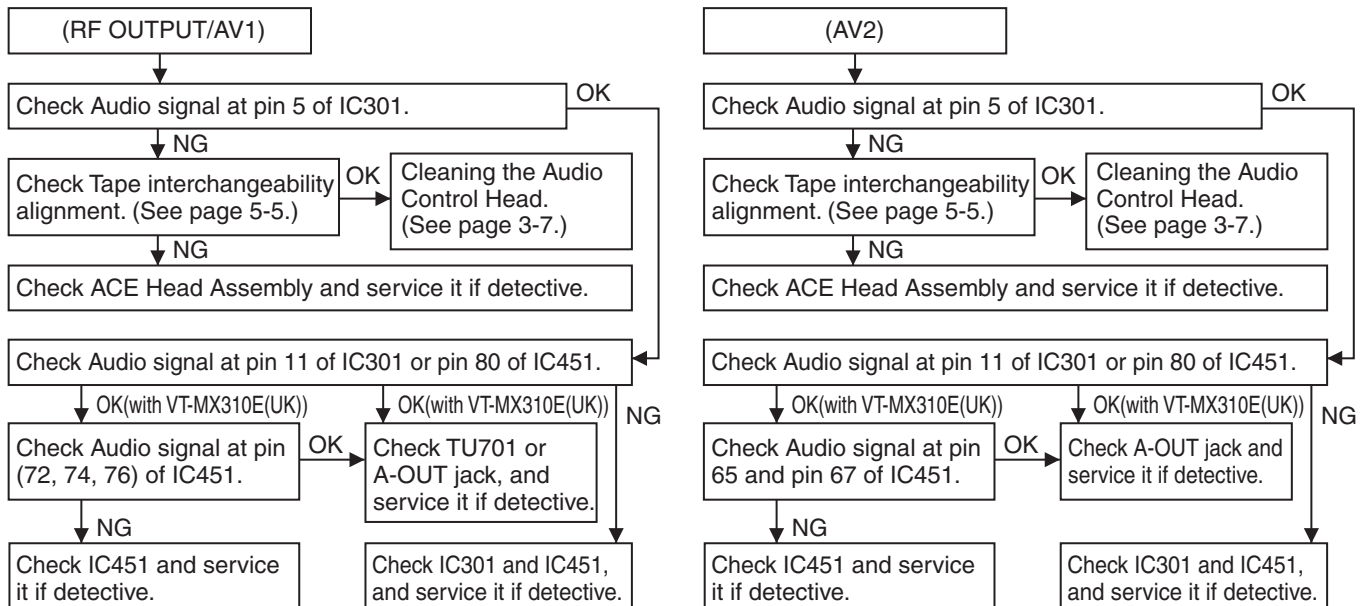
Video problem 2 (No playback Video)



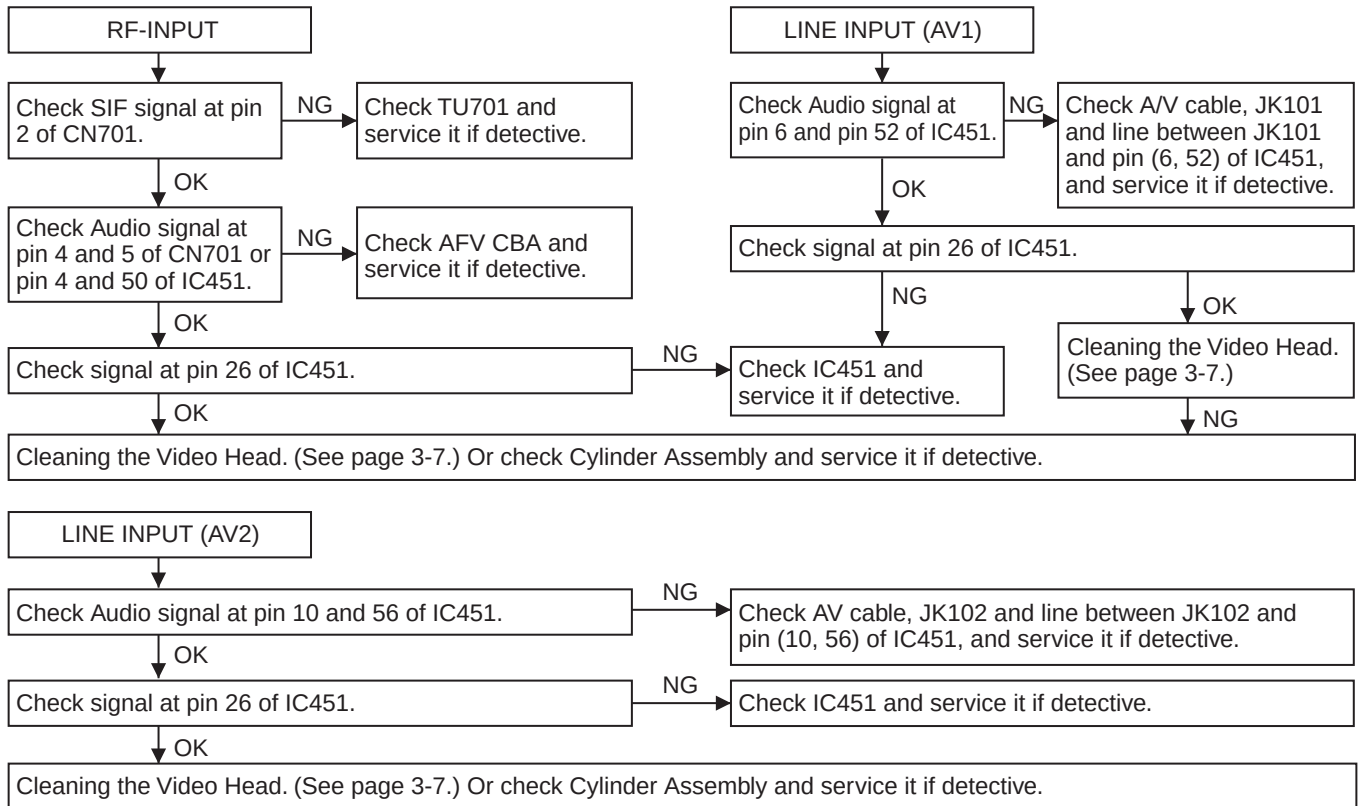
Audio problem 1 (No recording Normal Audio)



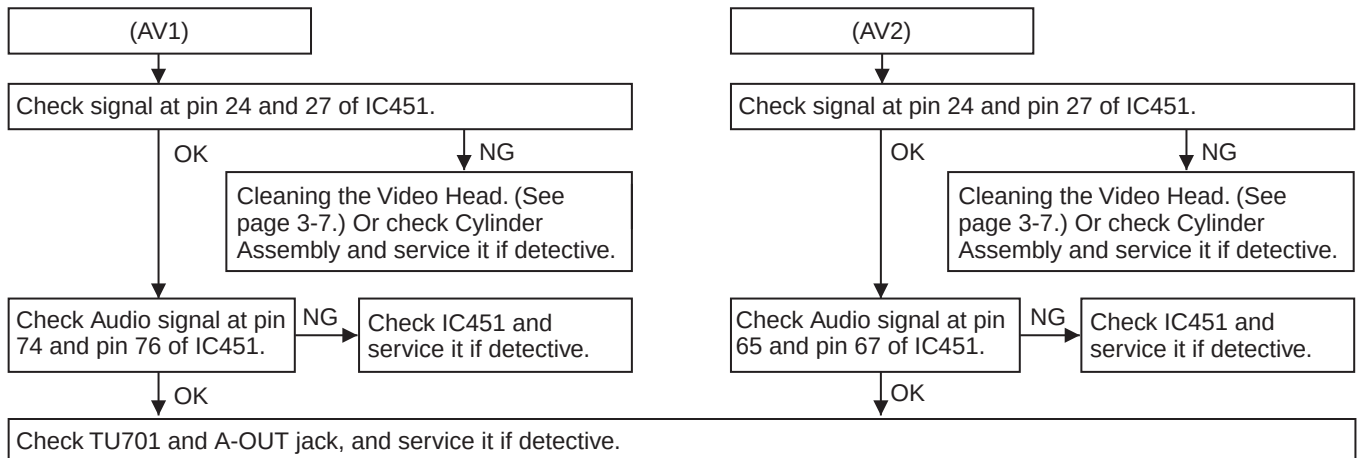
Audio problem 2 (No playback Normal Audio)



Audio problem 3 (No recording Hi-Fi Audio)

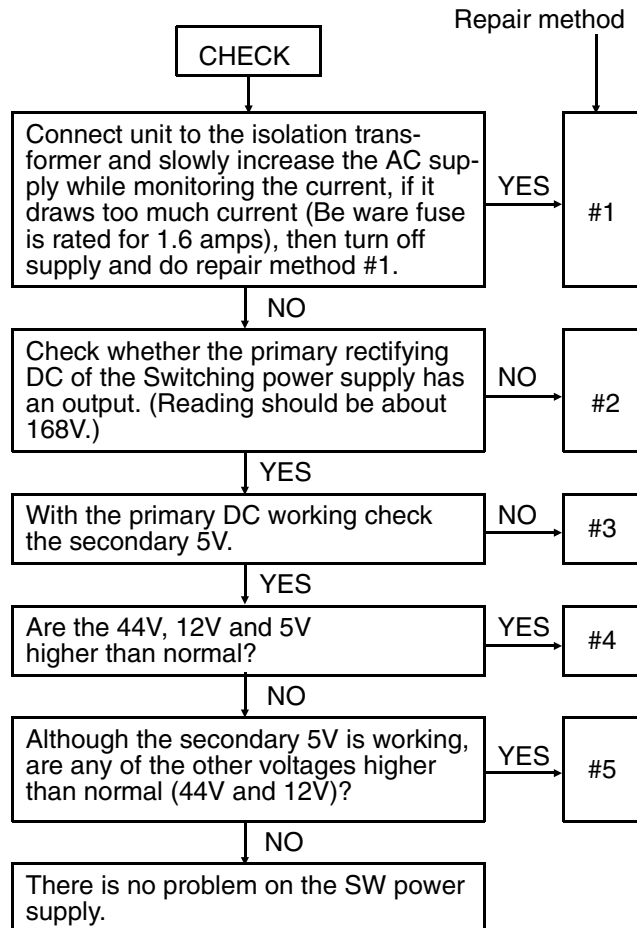


Audio problem 4 (No playback Hi-Fi Audio)



Power problem

It is highly recommended that a variable isolation transformer which can monitor current be used. (Alternatively a variable AC source which monitors current will do). Read directions below before power is added!



Repair method #1

(Power must be off)

Short circuit in the secondary side. check diode D014, D011, D012, D013, switching FET (Q001), control transistor (Q002), diode (D006), and resistor (R014) replace as necessary.

Disconnect 44V diode (D011), 12V diode (D013), 5V diode (D014). Check the load continuity of 44V line, 12V line and 5V line through a tester (resistance range).

If the tester indicates a lower resistance value around 0 ohm, the line is short-circuited.

Before repairing the switching power supply, find out the short-circuited area of such line and repair it.

If the tester does not indicate any low resistance value (around 0 ohm), no load is short-circuited and there is no problem.

1] Check for any defective parts while the secondary rectifying diodes are disconnected (D011, D013 and D014) perform a diode check in both forward and reverse directions through a tester.

2] Remove the following components and check for defects: snubber diode (D005), switching FET (Q001), source resistor (R006), control transistor (Q002).

Repair method #2

Check the fuse 1.6A (F001), primary rectifying diodes (D001-D004) as possible problems. Remove the above mentioned parts and check them. The circuit which turns on switching FET (Q001) may be regarded as a possible cause, even if the load at the secondary side is shorted, it can't be detected because switching FET (Q001) isn't operating. Perform check according to the step 1 and 2 of repair method #1 and check the following parts:

(Remove the part from PCB)

Switching FET (Q001), source resistor (R006), gate resistor (R008) and start resistor (R003, R004, R005 and R028).

Repair method #3

A circuit to turn on switching FET (Q001) may not work and this may be regarded as a cause of trouble. Even if the load at the secondary side is short-circuited, it cannot be detected because switching FET (Q001) does not turn on. Therefore, perform check according to the steps 1] and 2] of the repair method #1 and execute the under-mentioned parts breakage check.

(Remove the part from PCB.)

switching FET (Q001), source resistor (R006), control transistor (Q002), gate resistor (R008) and start resistor (R003, R004, R005 and R028).

Repair method #4

The feedback circuit which is monitored by the output of voltage may not work and this may be regarded as a possible cause, remove control transistor Q002 and check for defects. More over, a photo coupler (IC001) and transistor (Q004) may be defective, replace any defective parts with factory originals.

Repair method #5

If the output voltage of the secondary side is slightly high, the line load may be in the "OPEN" state and this may be regarded as a cause of trouble. If there is no output voltage on the secondary side, the rectifying diodes (D014) and (D015) may be defective.

3-2 STANDARD MAINTENANCE

3-2-1 Service Schedule of Components

h: Hours ○: Check ●: Change

Deck		Periodic Service Schedule			
Ref.No.	Part Name	1,000 h	2,000 h	3,000 h	4,000 h
B2	Cylinder Assembly	○	●	○	●
B3	Loading Motor Assembly			●	
B8	Pulley Assembly (HI)		●		●
B587	Tension Lever Assembly		●		●
B31	AC Head Assembly			●	
B573, B574	Reel S, Reel T			●	
B37	Capstan Motor		●		●
B52	Cap Belt		●		●
*B73	FE Head Assembly			●	
B86	F Brake Assembly (HI)		●		●
B133	Idler Assembly (HI)		●		●
B410	Pinch Arm Assembly		●		●
B414	M Brake (SP) Assembly (HI)		●		●
B416	M Brake (TU) Assembly (HI)		●		●
B525	LDG Belt		●		●

Notes:

- 1.Clean all parts for the tape transport (Upper Drum with Video Head / Pinch Roller / Audio Control Head / Full Erase Head) using 90% Isopropyl Alcohol.
- 2.After cleaning the parts, do all DECK ADJUSTMENTS.
- 3.For the reference numbers listed above, refer to Deck Exploded Views.

*** FE Head Assembly (B73) is used in VT-FX340E(UK) only.**

3-2-2 Cleaning

Cleaning of Video Head

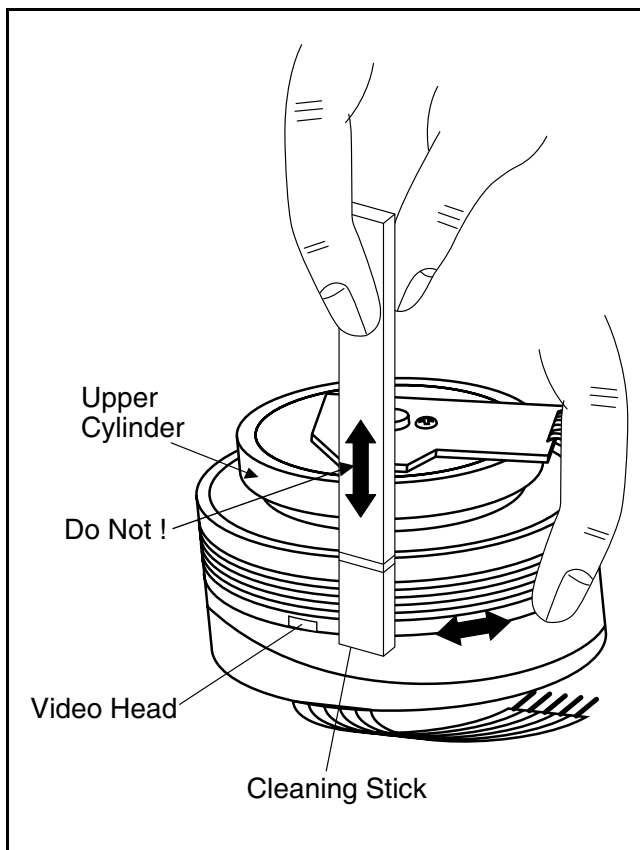
Clean the head with a head cleaning stick or chamois cloth.

Procedure

1. Remove the top cabinet.
2. Put on a glove (thin type) to avoid touching the upper and lower drum with your bare hand.
3. Put a few drops of 90% Isopropyl alcohol on the head cleaning stick or on the chamois cloth and, by slightly pressing it against the head tip, turn the upper drum to the right and to the left.

Notes:

1. The video head surface is made of very hard material, but since it is very thin, avoid cleaning it vertically.
2. Wait for the cleaned part to dry thoroughly before operating the unit.
3. Do not reuse a stained head cleaning stick or a stained chamois cloth.



Cleaning of ACE Head

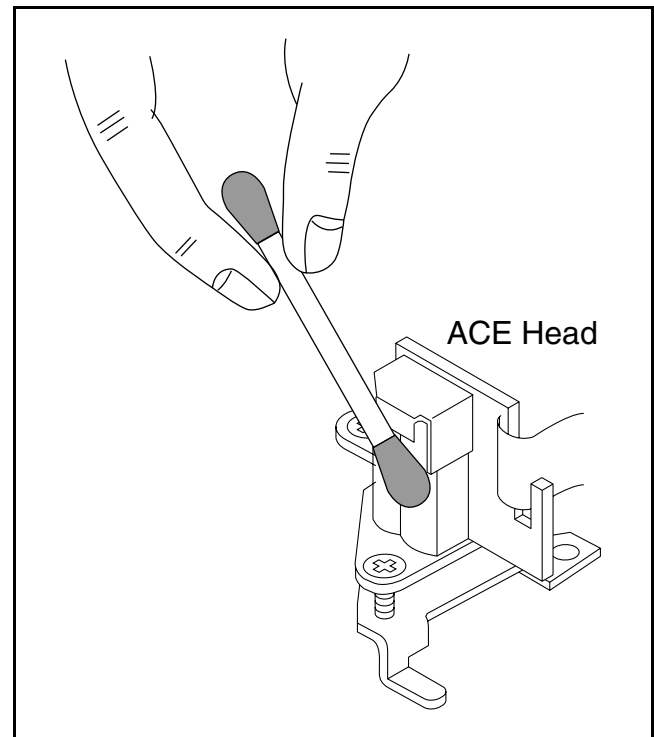
Clean the head with a cotton swab.

Procedure

1. Remove the top cabinet.
2. Dip the cotton swab in 90% Isopropyl alcohol and clean the ACE head. Be careful not to damage the upper drum and other tape running parts.

Notes:

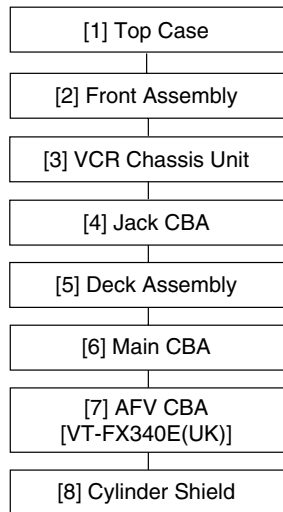
1. Avoid cleaning the ACE head vertically.
2. Wait for the cleaned part to dry thoroughly before operating the unit or damage may occur.



4-1 CABINET DISASSEMBLY INSTRUCTIONS

4-1-1 Disassembly Flowchart

This flowchart indicates the disassembly steps to gain access to item(s) to be serviced. When reassembling, follow the steps in reverse order. Bend, route, and dress the cables as they were originally.



- (1): Identification (location) No. of parts in the figures
 (2): Name of the part
 (3): Figure Number for reference
 (4): Identification of parts to be removed, unhooked, unlocked, released, unplugged, unclamped, or desoldered.
 P=Spring, L=Locking Tab, S=Screw, CN=Connector
 *=Unhook, Unlock, Release, Unplug, or Desolder
 e.g. 2(S-2) = two Screws (S-2),
 2(L-2) = two Locking Tabs (L-2)
 (5): Refer to "Reference Notes."

Reference Notes

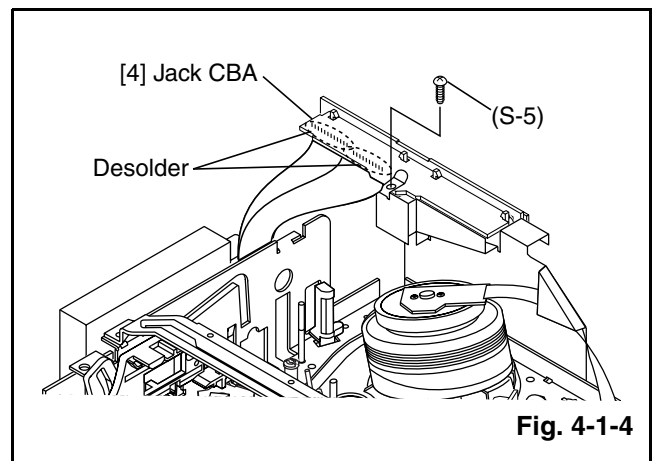
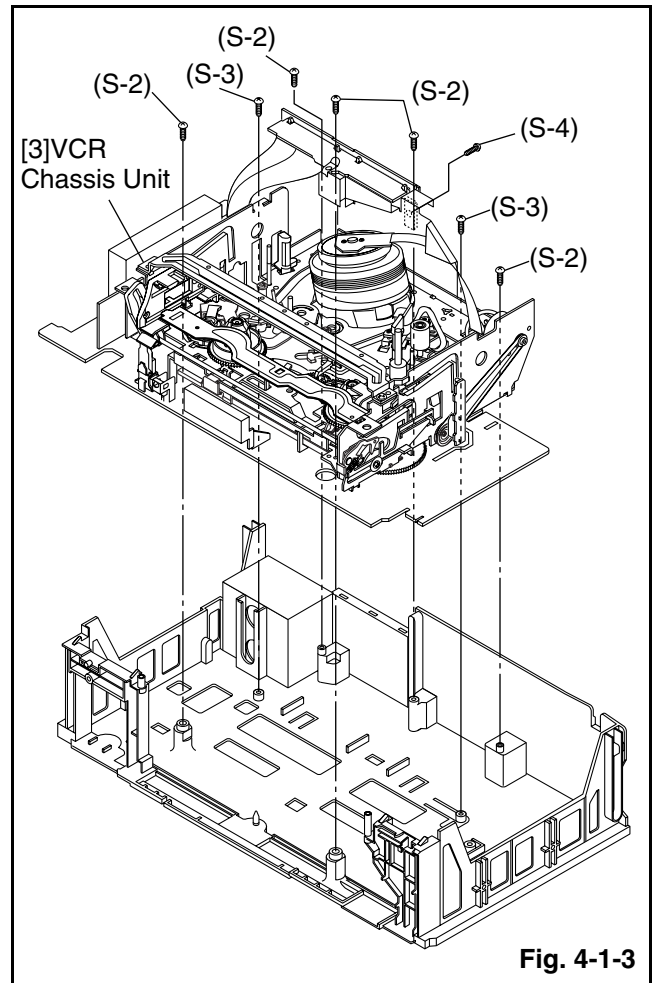
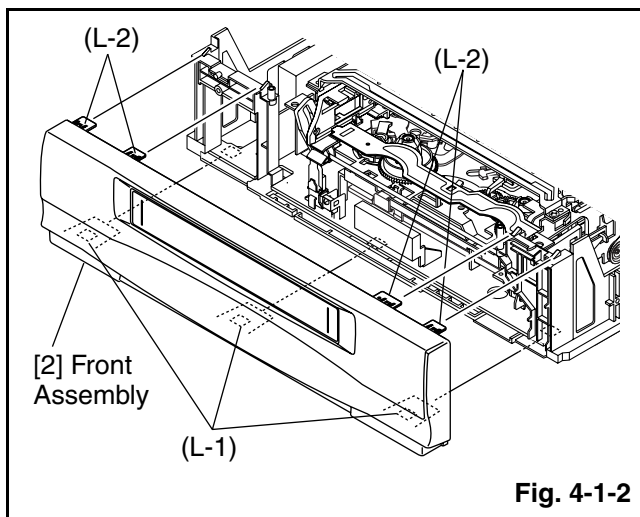
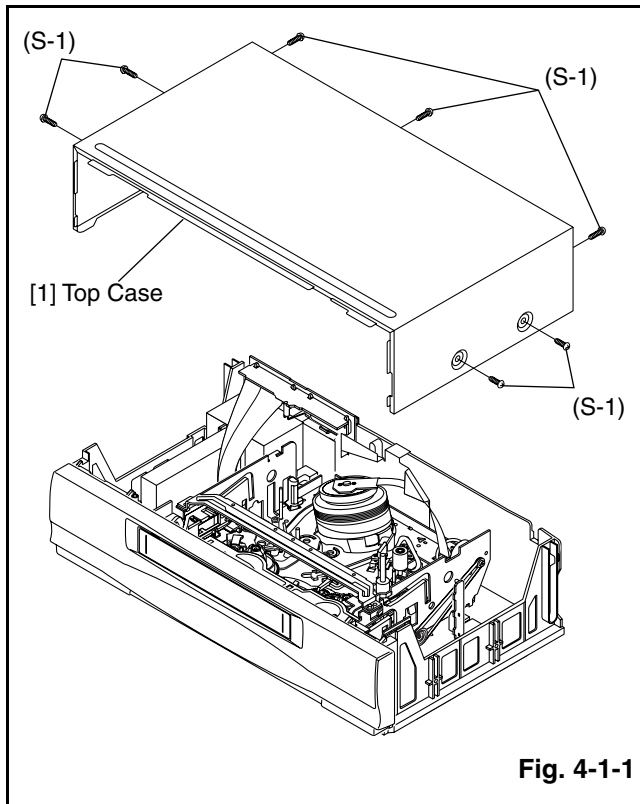
CAUTION: Locking Tabs (L-1) and (L-2) are fragile. Be careful not to break them.

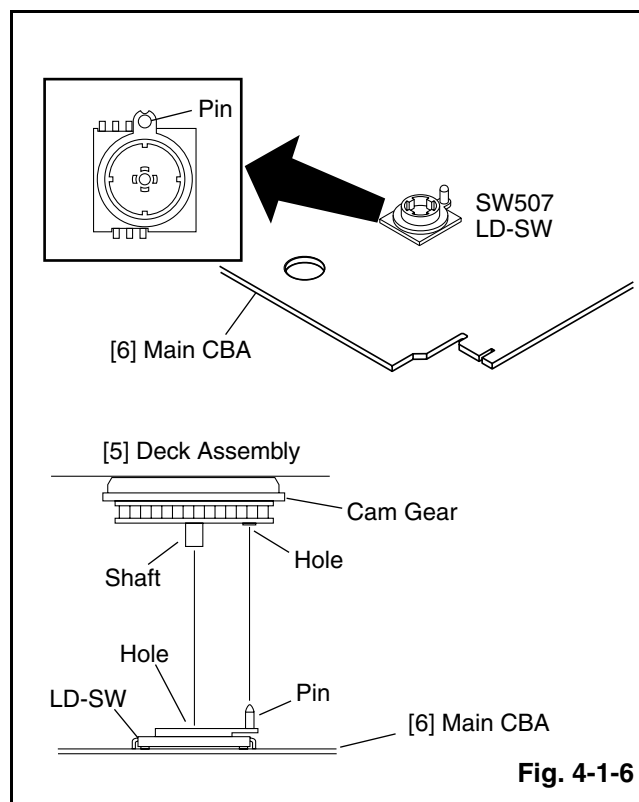
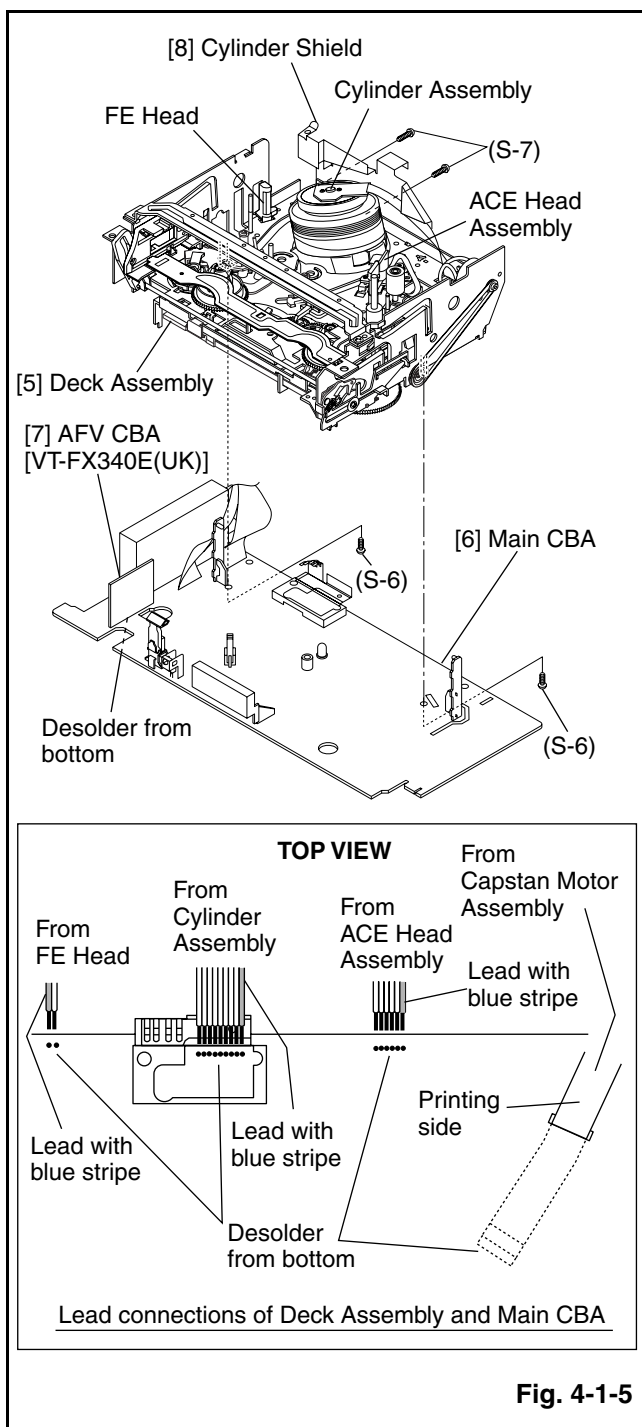
1. Remove five Screws (S-2), two Screws (S-3) and Screw (S-4). Then, slowly lift the VCR Chassis Unit (Deck Assembly, Jack CBA and Main CBA) up.
2. When reassembling, solder wire jumpers as shown in Fig. 4-1-5.
3. Before installing the Deck Assembly, be sure to place the pin of LD-SW on Main CBA as shown in Fig. 4-1-6. Then, install the Deck Assembly while aligning the hole of Cam Gear with the pin of LD-SW, the shaft of Cam Gear with the hole of LD-SW as shown in Fig. 4-1-6.

4-1-2. Disassembly Method

ID/ LOC. No.	PART	REMOVAL		
		Fig. No.	REMOVE/*UNHOOK/ UNLOCK/RELEASE/ UNPLUG/DESOLDER	Note
[1]	Top Case	4-1-1	7(S-1)	-
[2]	Front Assembly	4-1-2	*3(L-1),*4(L-2)	-
[3]	VCR Chassis Unit	4-1-3	5(S-2), 2(S-3), (S-4),	1
[4]	Jack CBA	4-1-4	Desolder, (S-5)	-
[5]	Deck Assembly	4-1-5 4-1-6	2(S-6), Desolder	2,3
[6]	Main CBA	4-1-5	-----	-
[7]	AFV CBA [VT-FX340E(UK)]	4-1-5	-----	-
[8]	Cylinder Shield	4-1-5	2(S-7)	-

↓ ↓ ↓ ↓ ↓
 (1) (2) (3) (4) (5)





4-2 DISASSEMBLY/ASSEMBLY PROCEDURES OF DECK MECHANISM

Before following the procedures described below, be sure to remove the deck assembly from the cabinet. (Refer to CABINET DISASSEMBLY INSTRUCTIONS on page 4-1.)

All the following procedures, including those for adjustment and replacement of parts, should be done in Eject mode; see the positions of [44] and [45] in Fig. 4-2-1 on page 4-6. When reassembling, follow the steps in reverse order.

STEP /LOC. No.	START-ING No.	PART		REMOVAL		INSTALLATION
				Fig. No.	REMOVE/*UNHOOK/ UNLOCK/RELEASE/ UNPLUG/DESOLDER	ADJUSTMENT CONDITION
[1]	[1]	Guide Holder A	T	4-2-3	2(S-1)	
[2]	[1]	Cassette Holder Assembly	T	4-2-4		
[3]	[2]	Slider (SP)	T	4-2-5	*(L-1)	
[4]	[2]	Slider (TU)	T	4-2-5	*(L-2)	
[5]	[4]	Lock Lever	T	4-2-5	*(L-3), *(P-1)	
[6]	[2]	Cassette Plate	T	4-2-5		
[7]	[7]	Cylinder Assembly	T	4-2-1,4-2-6	Desolder, 3(S-2)	
[8]	[8]	Loading Motor Assembly	T	4-2-1,4-2-7	Desolder, LDG Belt, 2(S-3)	
[9]	[9]	AC Head Assembly	T	4-2-1,4-2-7	(S-4)	
[10]	[2]	Tape Guide Arm Assembly	T	4-2-1,4-2-8	*(P-2)	
[11]	[10]	C Door Opener	T	4-2-1,4-2-8	*(L-4)	
[12]	[11]	Pinch Arm (B)	T	4-2-1,4-2-8	*(P-3)	
[13]	[12]	Pinch Arm Assembly	T	4-2-1,4-2-8		
[14]	[14]	FE Head Assembly	T	4-2-1,4-2-9	(S-5)	
[15]	[15]	Prism	T	4-2-1,4-2-9	(S-6)	
[16]	[2]	Slider Shaft	T	4-2-10	*(L-5)	
[17]	[16]	C Drive Lever (SP)	T	4-2-10		
[18]	[16]	C Drive Lever (TU)	T	4-2-10	(S-7), *(P-4)	
[19]	[19]	Capstan Motor	B	4-2-2,4-2-11	3(S-8), Cap Belt	
[20]	[20]	Clutch Assembly (HI)	B	4-2-2,4-2-12	(C-1)	
[21]	[20]	Center Gear	B	4-2-12		
+ [22]	[22]	F Brake Assembly (HI)	B	4-2-2,4-2-12	*(L-6)	
[23]	[22]	Worm Holder	B	4-2-2,4-2-13	(S-9), *(L-7), *(L-8)	
[24]	[22]	Pulley Assembly (HI)	B	4-2-2,4-2-13		
[25]	[25]	Mode Gear	B	4-2-2,4-2-13	(C-2)	
[26]	[20],[25]	Mode Lever (HI)	B	4-2-2,4-2-13	(C-3)	
[27]	[22],[23], [26]	Cam Gear (A) (HI)	B	4-2-2,4-2-13	(C-4)	(+)Refer to Alignment Sec. Page 4-11
[28]	[26]	TR Gear C	B	4-2-2,4-2-13	(C-5)	
[29]	[28]	TR Gear Spring	B	4-2-13		
[30]	[29]	TR Gear A/B	B	4-2-13		
[31]	[31]	FF Arm (HI)	B	4-2-1,4-2-13		
[32]	[26]	Idler Assembly (HI)	B	4-2-1,4-2-14	*(L-9)	
[33]	[26]	BT Arm	B	4-2-2,4-2-14	*(P-5)	

STEP /LOC. No.	START-ING No.	PART		REMOVAL		INSTALLATION
				Fig. No.	REMOVE/*UNHOOK/ UNLOCK/RELEASE/ UNPLUG/DESOLDER	ADJUSTMENT CONDITION
[34]	[26]	Loading Arm (SP) Assembly	B	4-2-2,4-2-14		(+)Refer to Alignment Sec.Page 4-11
[35]	[34]	Loading Arm (TU) Assembly	B	4-2-2,4-2-14		(+)Refer to Alignment Sec.Page 4-11
[36]	[16],[26]	M Brake (TU) Assembly (HI)	T	4-2-1,4-2-15		
[37]	[2],[26]	M Brake (SP) Assembly (HI)	T	4-2-1,4-2-15	*(P-6)	
[38]	[37]	Tension Lever Assembly	T	4-2-1,4-2-15		
[39]	[38]	T Lever Holder	T	4-2-15	*(L-10)	
[40]	[40]	M Gear (HI)	T	4-2-1,4-2-15	(C-6)	
[41]	[15],[40]	Sensor Gear (HI)	T	4-2-1,4-2-15	(C-7)	
[42]	[36],[40]	Reel T	T	4-2-1,4-2-15		
[43]	[38]	Reel S	T	4-2-1,4-2-15		
[44]	[34],[38]	Moving Guide S Preparation	T	4-2-1,4-2-16		
[45]	[35]	Moving Guide T Preparation	T	4-2-1,4-2-16		
[46]	[19]	TG Post Assembly	T	4-2-1,4-2-16	*(L-11)	
[47]	[27]	Rack Assembly	R	4-2-17		(+)Refer to Alignment Sec.Page 4-11
[48]	[47]	F Door Opener	R	4-2-17		
[49]	[49]	Cleaner Assembly	T	4-2-1,4-2-6		
[50]	[49]	CL Post	T	4-2-6	*(L-12)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)

(1): Follow steps in sequence. When reassembling, follow the steps in reverse order.

These numbers are also used as identification (location) No. of parts in the figures.

(2): Indicates the part to start disassembling with in order to disassemble the part in column (1).

(3): Name of the part

(4): Location of the part: T=Top B=Bottom R=Right L=Left

(5): Figure Number

(6): Identification of parts to be removed, unhooked, unlocked, released, unplugged, unclamped, or desoldered.

P=Spring, W=Washer, C=Cut Washer, S=Screw, *=Unhook, Unlock, Release, Unplug, or Desolder

e.g., 2(L-2) = two Locking Tabs (L-2).

(7): Adjustment Information for Installation

(+):Refer to Deck Exploded Views for lubrication.

*** FE Head Assembly ([22]) is used in VT-FX340E(UK) only.**

Top View

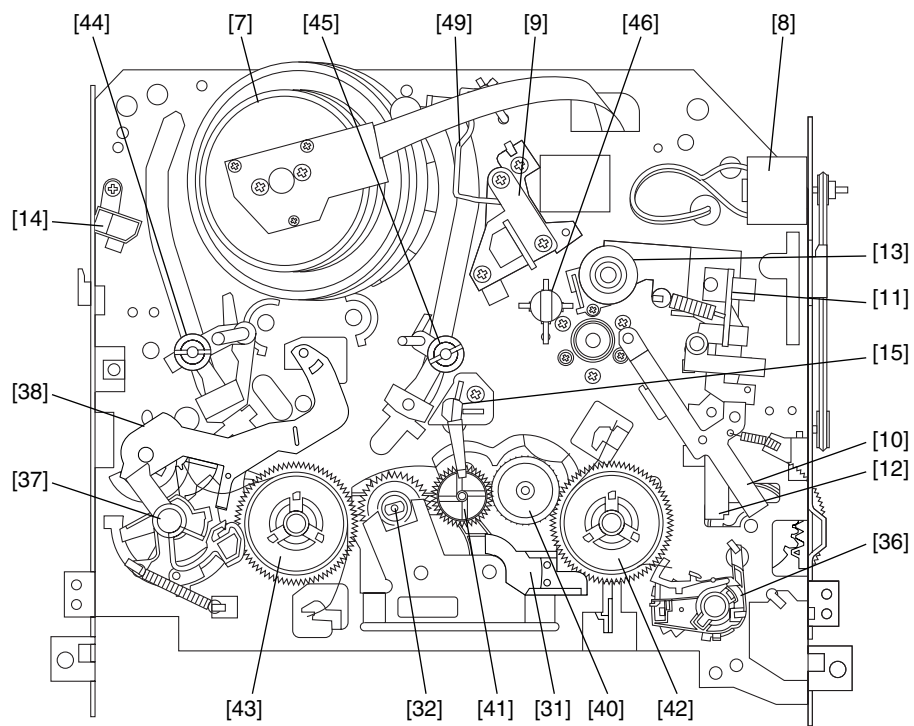


Fig. 4-2-1

Bottom View

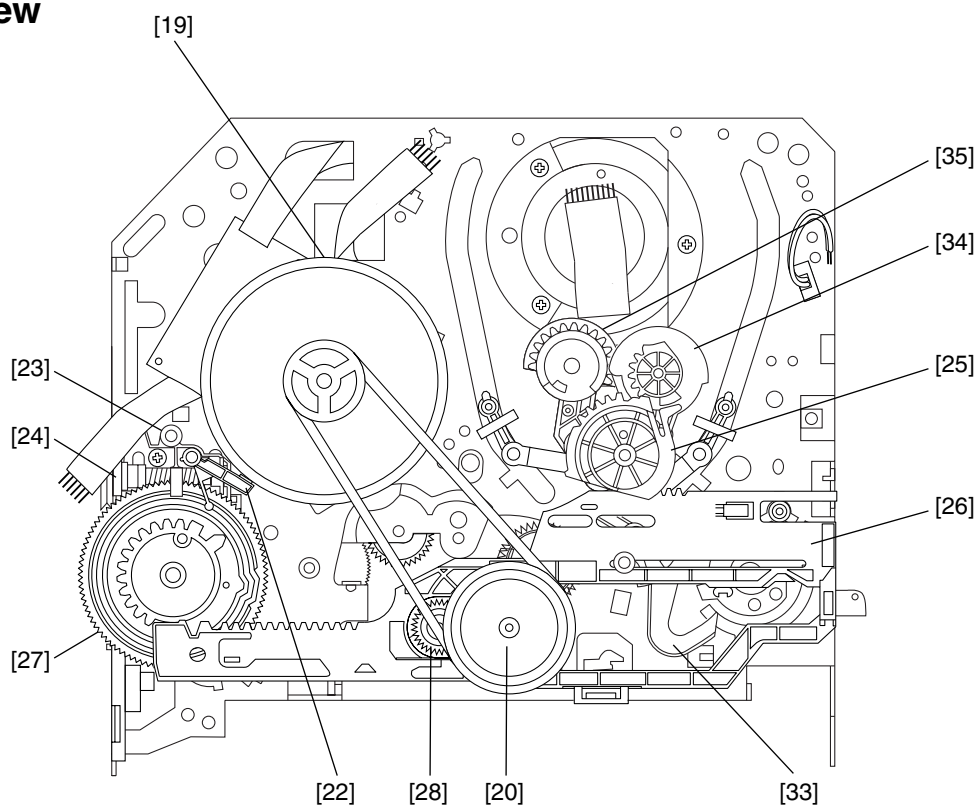
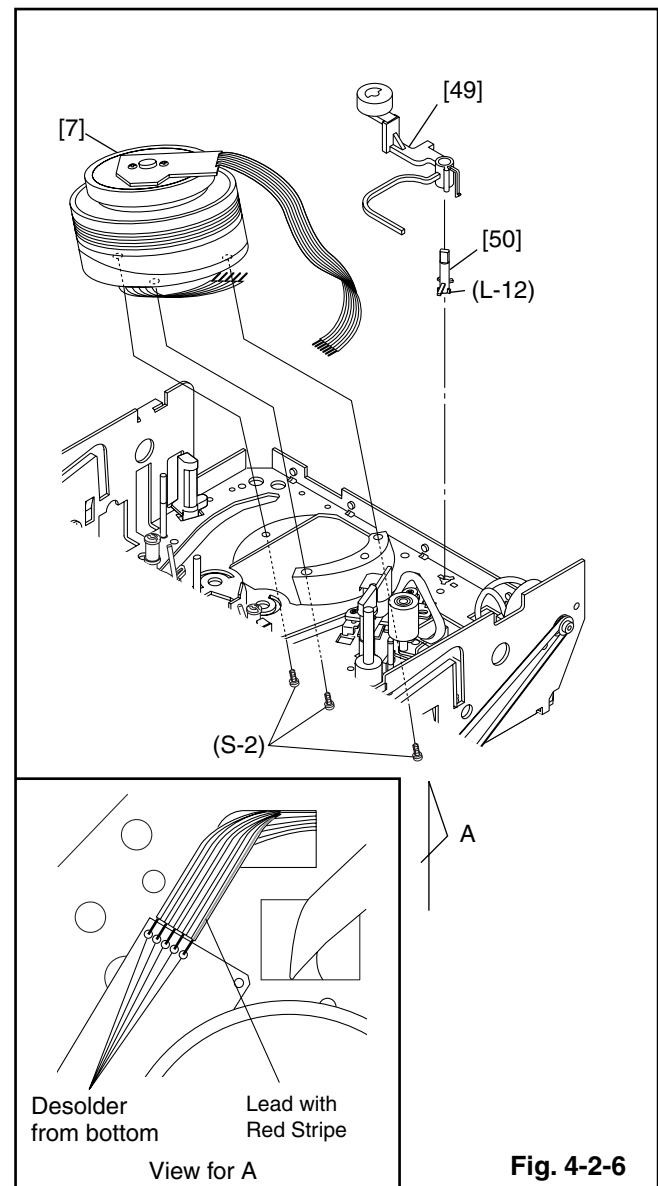
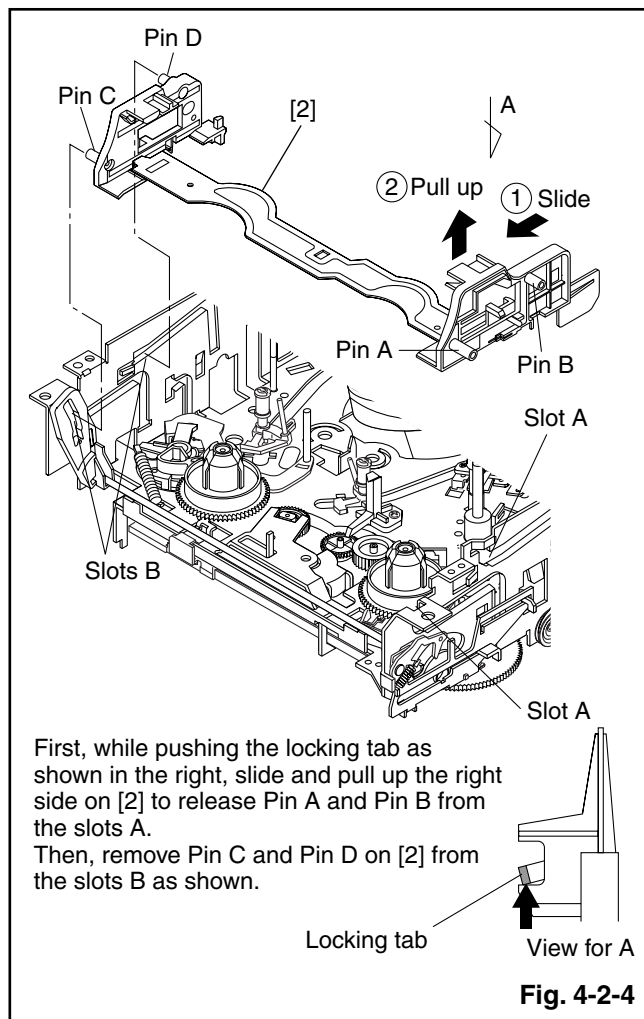
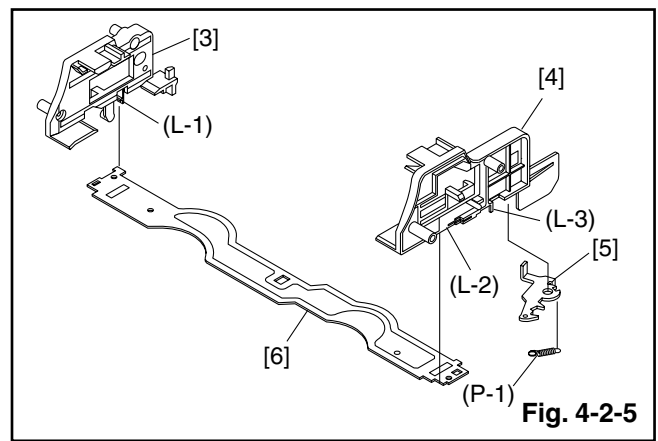
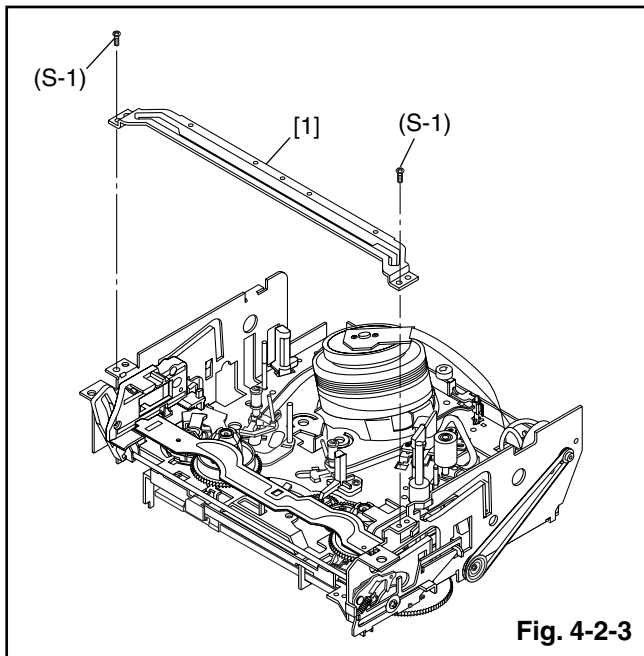
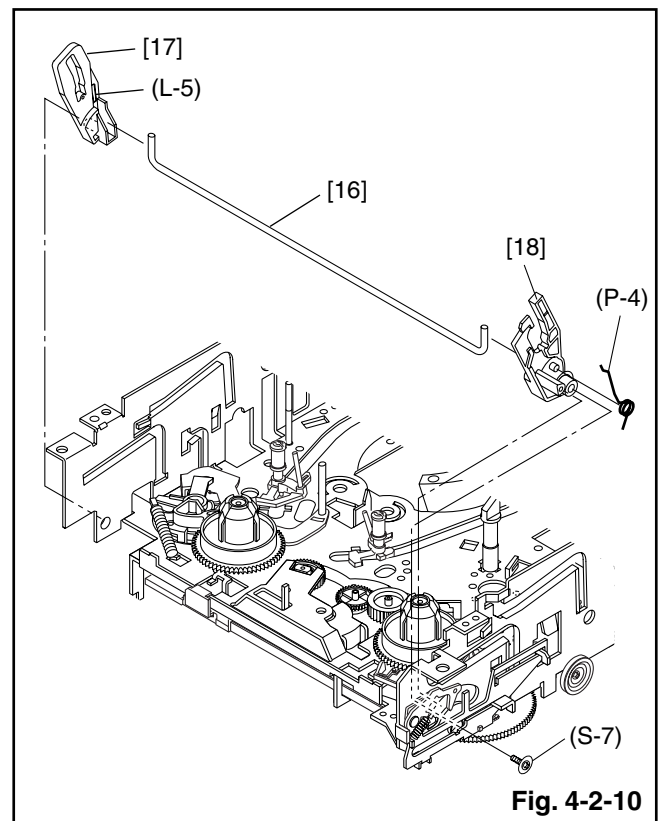
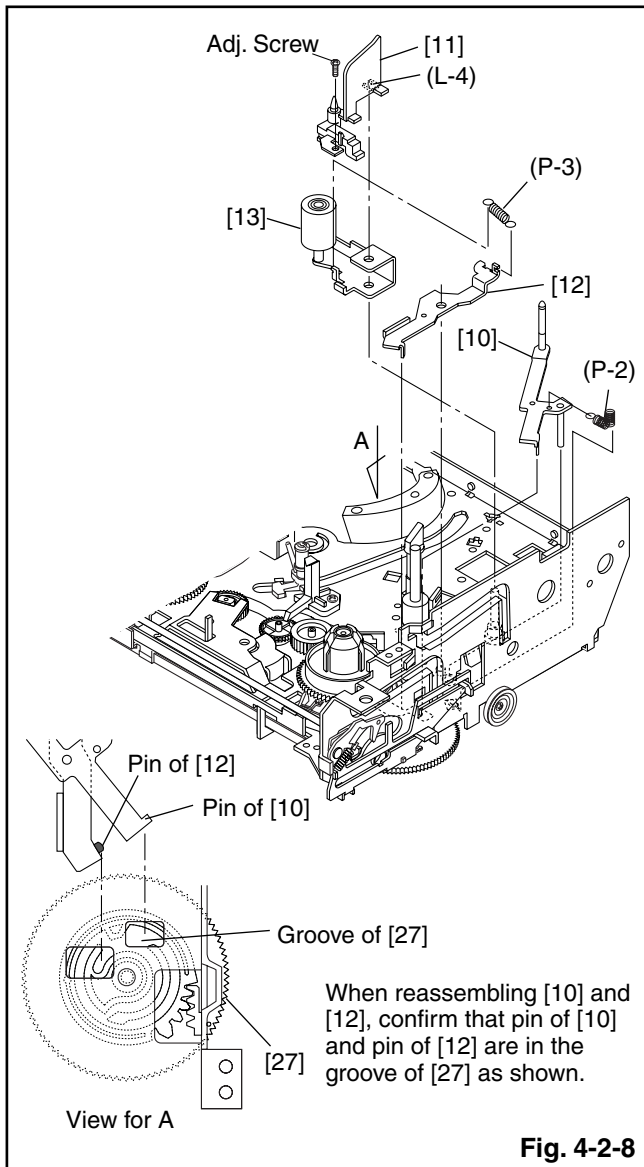
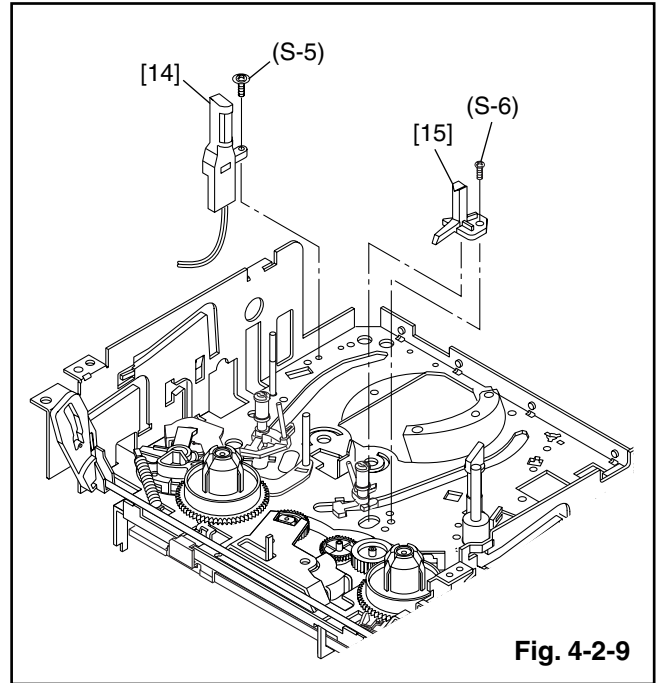
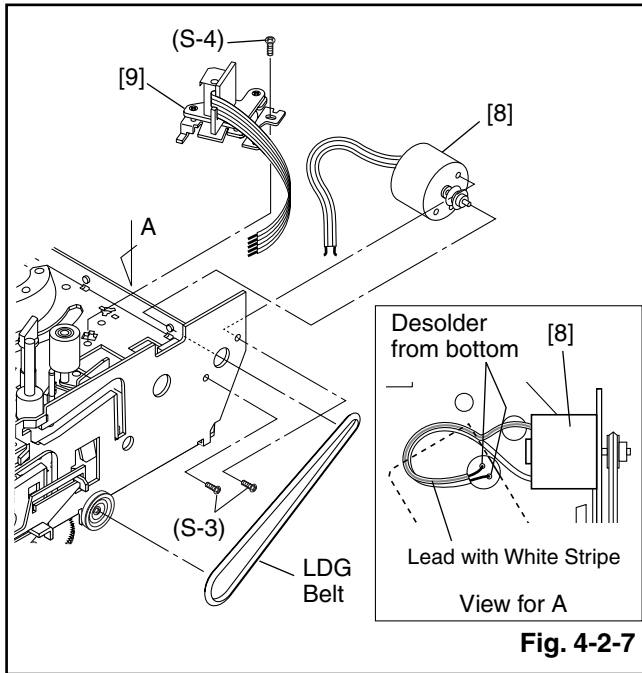
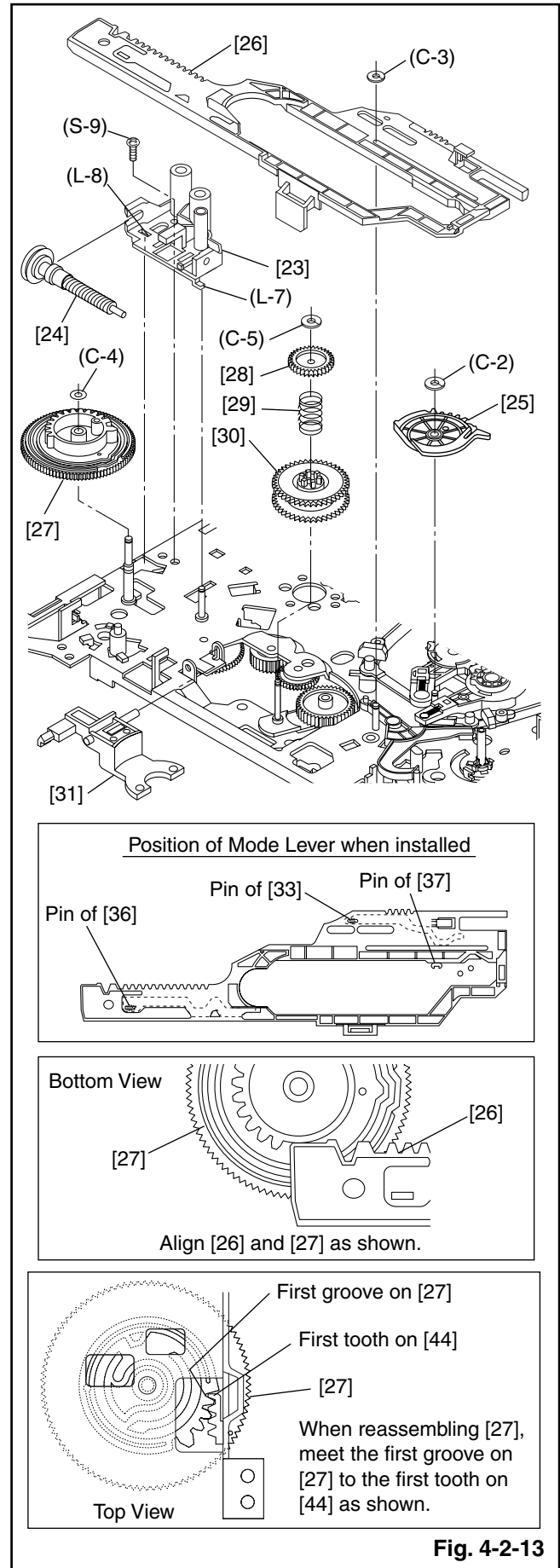
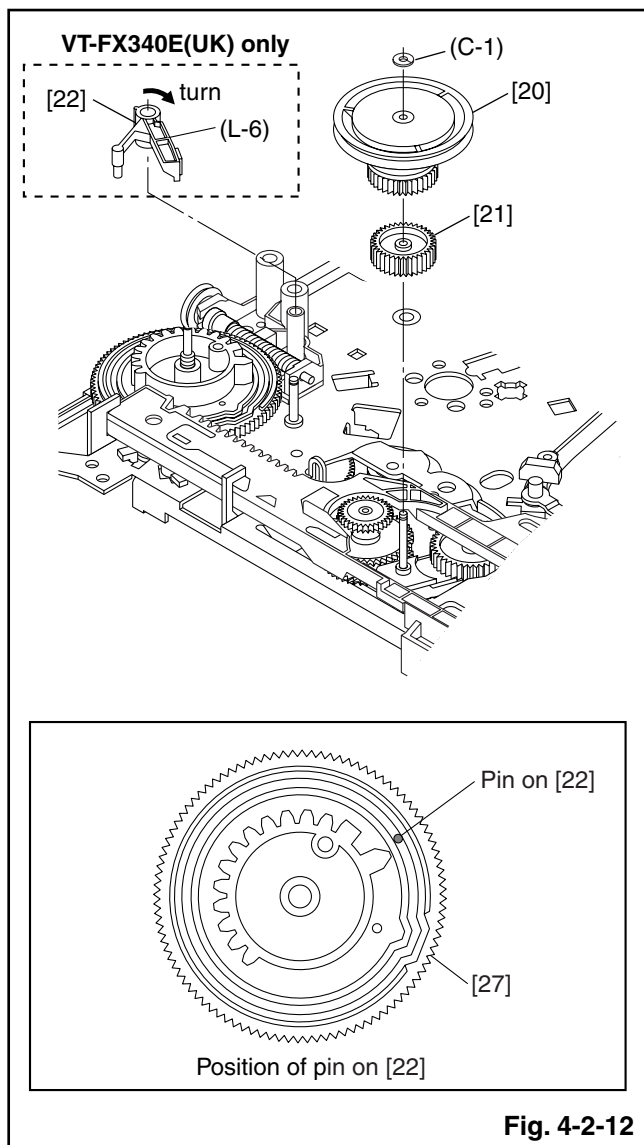
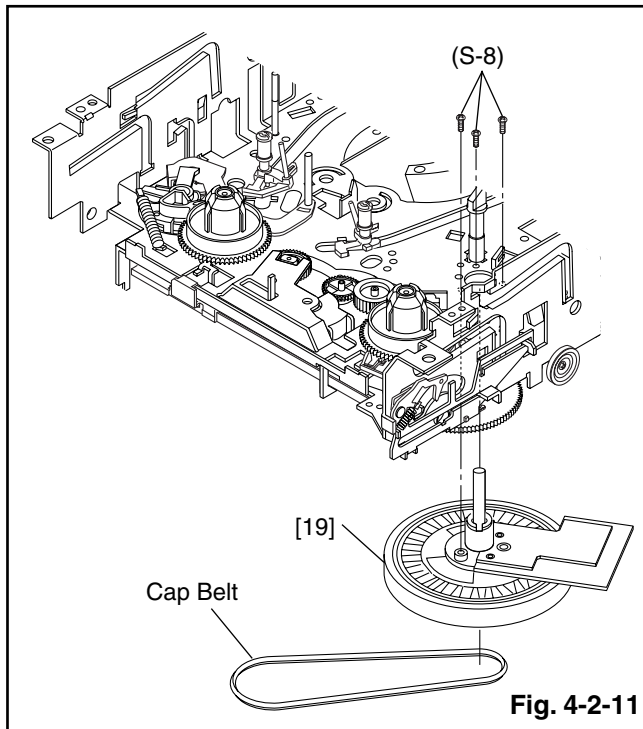
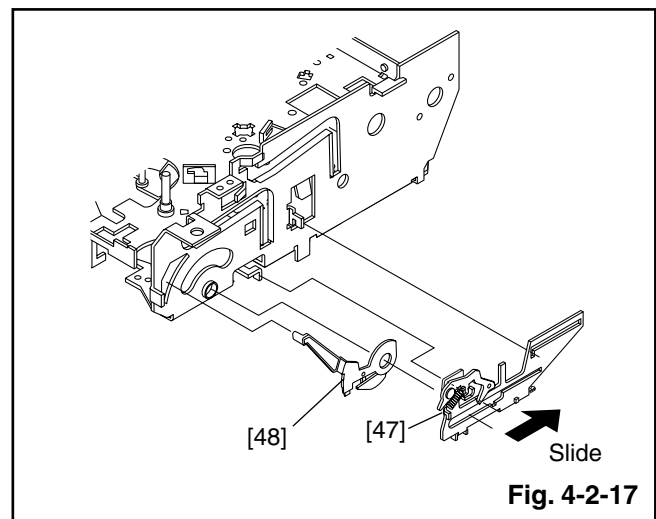
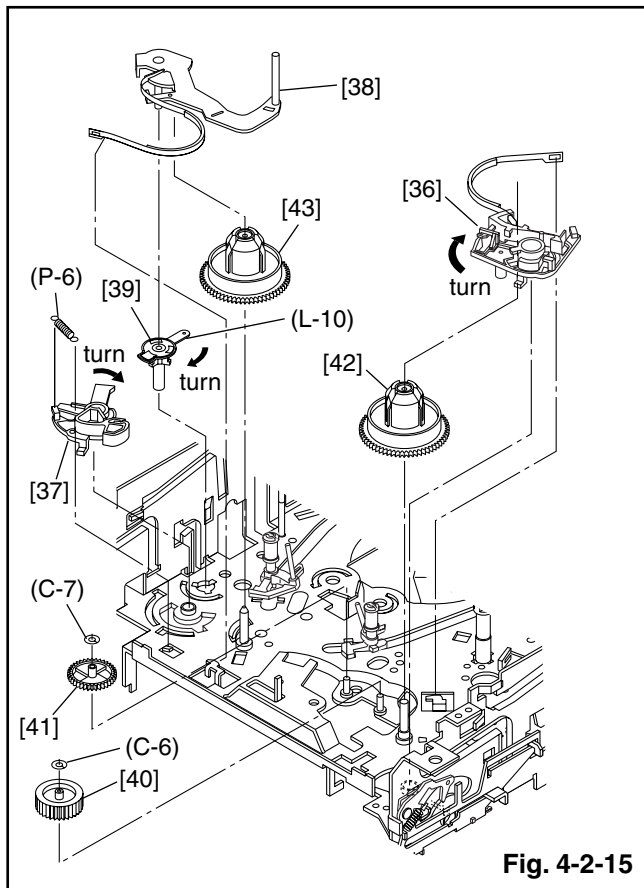
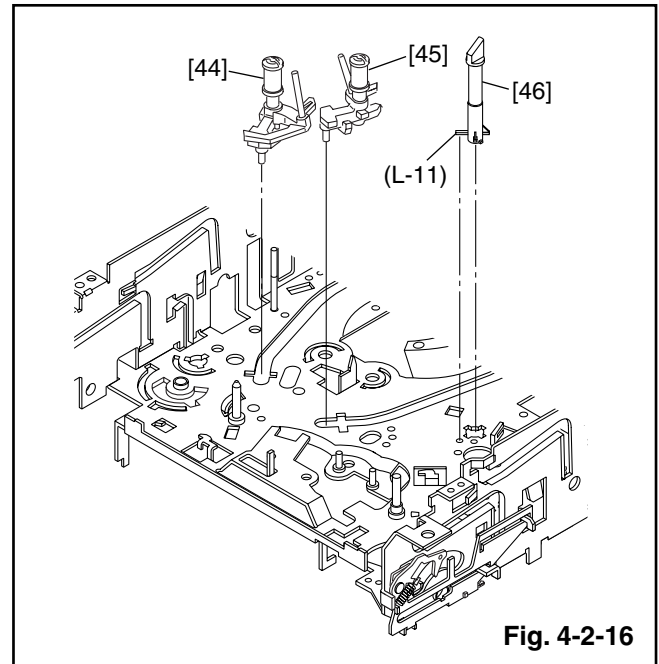
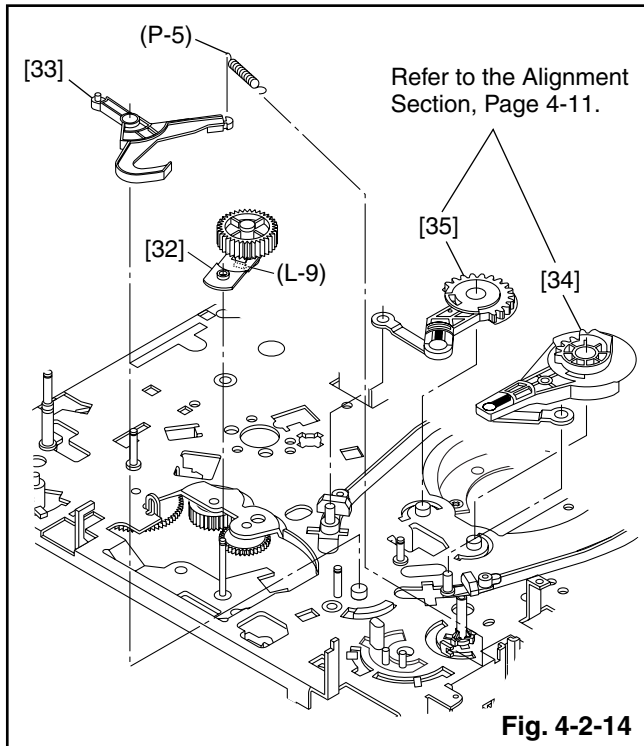


Fig. 4-2-2









4-3 ALIGNMENT PROCEDURES OF MECHANISM

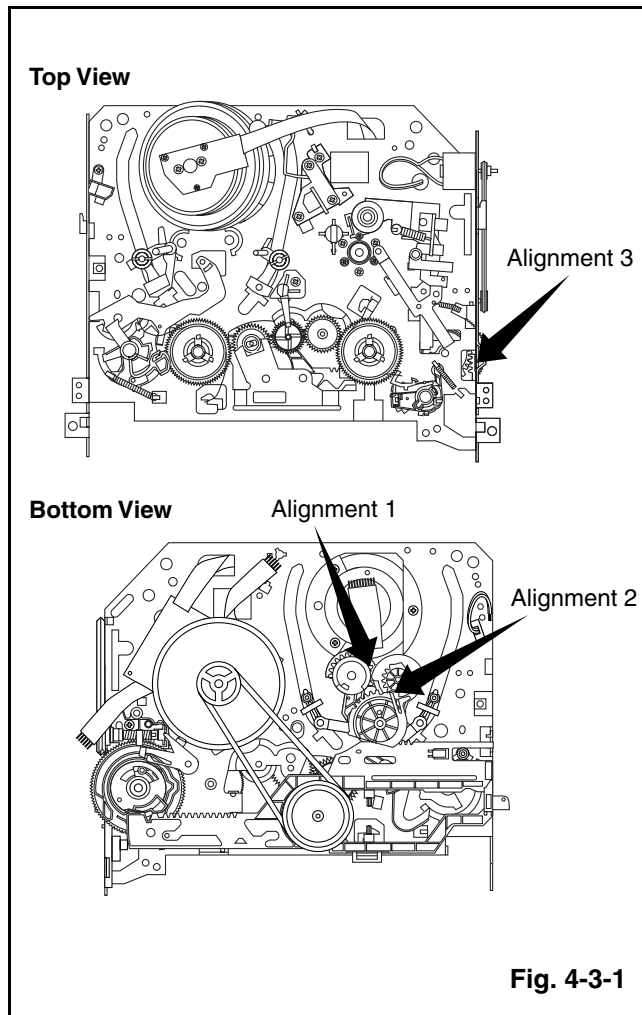
The following procedures describe how to align the individual gears and levers that make up the tape loading/unloading mechanism. Since information about the state of the mechanism is provided to the System Control Circuit only through the Mode Switch, it is essential that the correct relationship between individual gears and levers be maintained.

All alignments are to be performed with the mechanism in Eject mode, in the sequence given. Each procedure assumes that all previous procedures have been completed.

IMPORTANT:

If any one of these alignments is not performed properly, even if off by only one tooth, the unit will unload or stop and it may result in damage to the mechanical or electrical parts.

Alignment points in Eject Position



Alignment 1

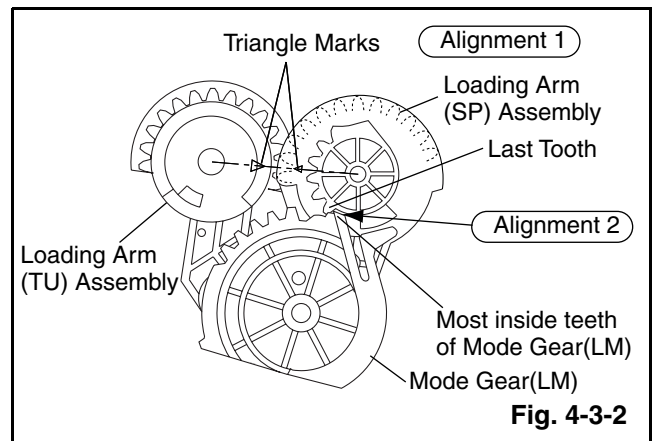
Loading Arm (SP) and (TU) Assembly

Install Loading Arm (SP) and (TU) Assembly so that their triangle marks point to each other as shown in Fig. 4-3-2.

Alignment 2

Mode Gear

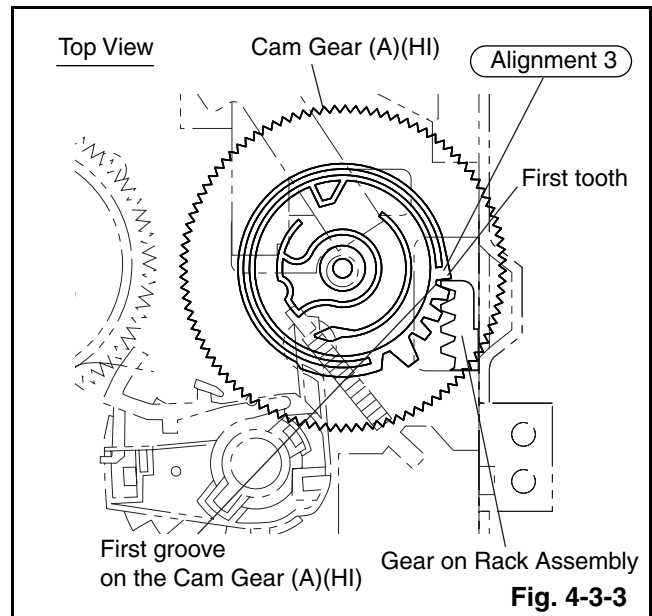
Keeping the two triangles pointing at each other, install the Loading Arm (TU) Assembly so that the last tooth of the gear meets the most inside teeth of the Mode Gear. See Fig. 4-3-2.



Alignment 3

Cam Gear (A)(HI), Rack Assembly

Install the Rack Assembly so that the first tooth on the gear of the Rack Assembly meets the first groove on the Cam Gear (A)(HI) as shown in Fig. 4-3-3.



5-1 PREPARATION FOR SERVICING

5-1-1 How to Enter the Service Mode

About Optical Sensors

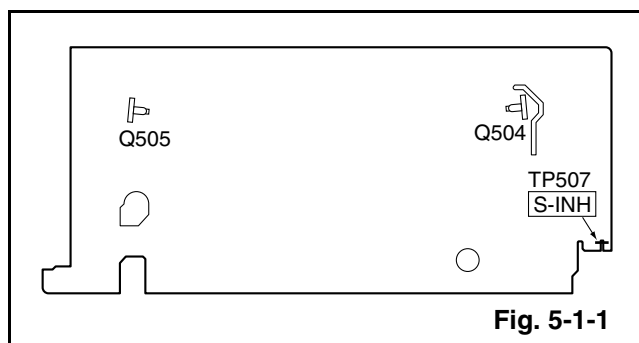
Caution:

An optical sensor system is used for the Tape Start and End Sensors on this equipment. Carefully read and follow the instructions below. Otherwise the unit may operate erratically.

What to do for preparation

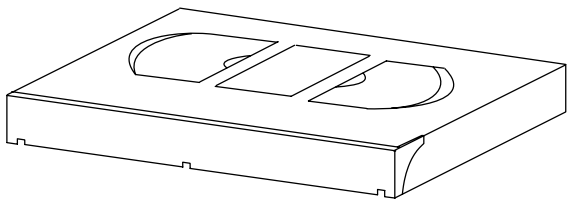
Insert a tape into the Deck Mechanism Assembly and press the PLAY button. The tape will be loaded into the Deck Mechanism Assembly. Make sure the power is on, connect TP507 (SENSOR INHIBITION) to GND. This will stop the function of Tape Start Sensor, Tape End Sensor and Reel Sensors. (If these TPs are connected before plugging in the unit, the function of the sensors will stay valid.) See Fig. 5-1-1.

Note: Because the Tape End Sensors are inactive, do not run a tape all the way to the start or the end of the tape to avoid tape damage.

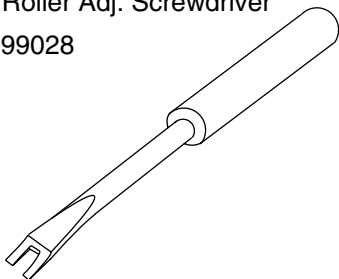


5-2 FIXTURE AND TAPE FOR ADJUSTMENT

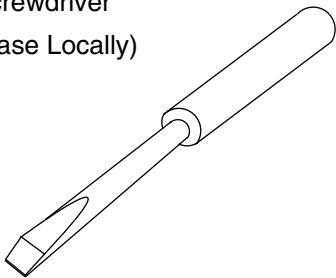
1. Alignment Tape
No. 7099052 (MH-2)



2. Guide Roller Adj. Screwdriver
No. 7099028



3. Flat Screwdriver
(Purchase Locally)



5-2-1 How To Use The Fixtures And Tape

Item No.	Name	Part No.	Adjustment
1	Alignment Tape	7099052	● Head Switching Point ● Tape Interchangeability Alignment
2	Guide Roller Adj. Screwdriver	7099028	● Guide Roller
3	Flat Screwdriver	Purchase Locally	● X Value Alignment

5-3 ELECTRICAL ADJUSTMENT INSTRUCTIONS

General Note: "CBA" is an abbreviation for "Circuit Board Assembly."

NOTE:

- 1.Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to do these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.
- 2.To perform these alignment / confirmation procedures, make sure that the tracking control is set in the center position: Press either "CHANNEL ▼" or "CHANNEL ▲" button on the front panel first, then the "PLAY" button on the front panel.

5-3-1 Test Equipment Required

- 1.Oscilloscope: Dual-trace with 10:1 probe, V-Range: 0.001~50V/Div., F-Range: DC~AC-20MHz
- 2.Alignment Tape (MH-2)

5-3-2 Head Switching Position Adjustment

Purpose:

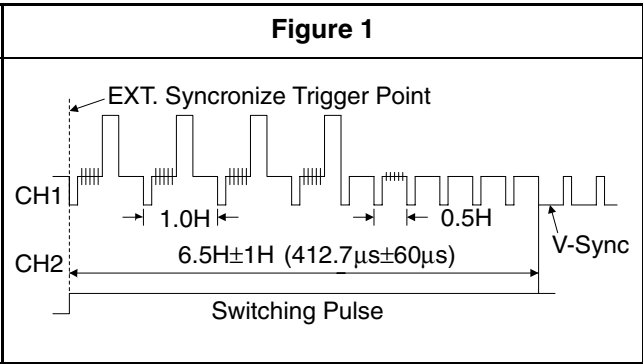
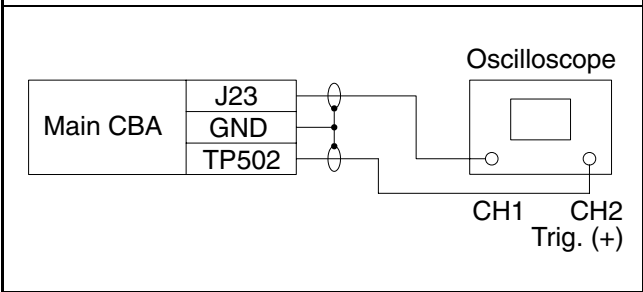
To determine the Head Switching point during playback.

Symptom of Misadjustment:

May cause Head Switching noise or vertical jitter in the picture.

Test point	Adj.Point	Mode	Input
J23(V-OUT) TP502(RF-SW) GND	VR501 (Switching Point) (MAIN CBA)	PLAY (SP)	----
Tape	Measurement Equipment	Spec.	
MH-2	Oscilloscope	6.5H±1H (412.7µs±60µs)	

Connections of Measurement Equipment



Reference Notes:

Playback the Alignment tape and adjust VR501 so that the V-sync front edge of the CH1 video output waveform is at the 6.5H±1H(412.7µs±60µs) delayed position from the rising edge of the CH2 head switching pulse waveform.

5-4 MECHANICAL ALIGNMENT PROCEDURES

Explanation of alignment for the tape to correctly run starts on the next page. Refer to the information below on this page if a tape gets stuck, for example, in the mechanism due to some electrical trouble of the unit.

5-4-1 Service Information

A. Method for Manual Tape Loading/Unloading

To load a cassette tape manually:

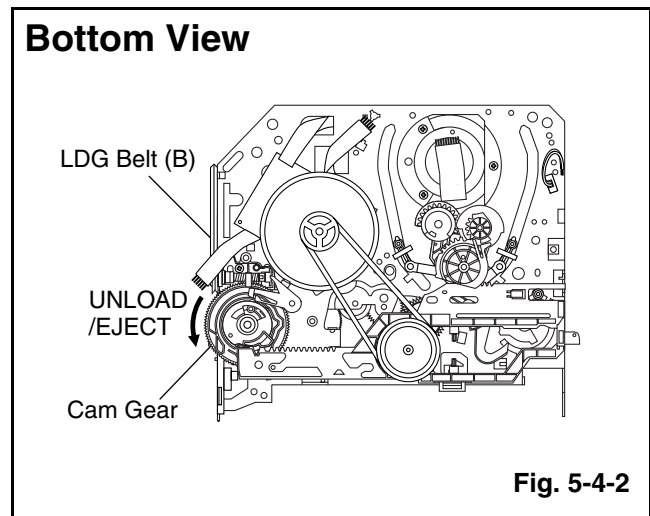
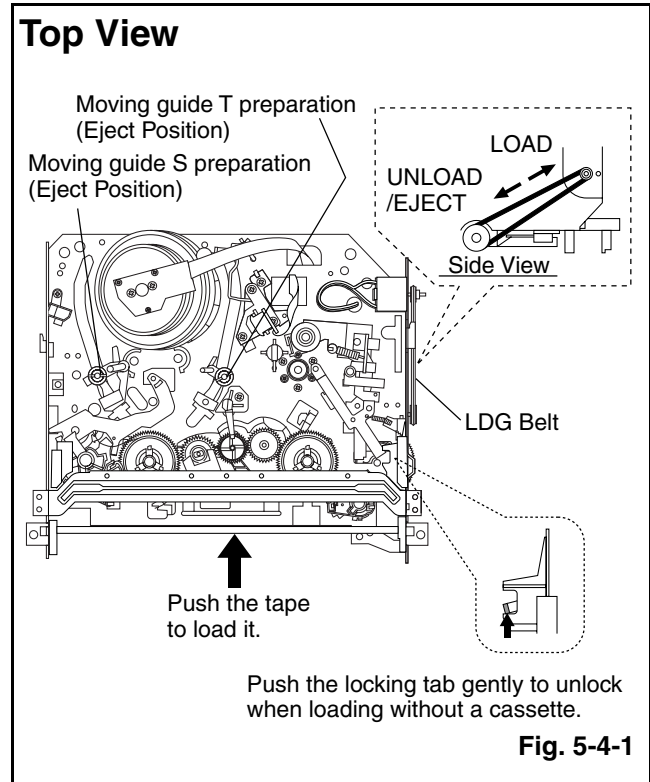
1. Disconnect the AC plug.
2. Remove the Top Case and Front Assembly.
3. Insert a cassette tape. Though the tape will not be automatically loaded, make sure that the cassette tape is all the way in at the inlet of the Cassette Holder. To confirm this, lightly push the cassette tape further in and see if the tape comes back out, by a spring motion, just as much as you have pushed in.
4. Turn the LDG Belt in the appropriate direction shown in Fig. 5-4-1 for a minute or two to complete this task.

To unload a cassette tape manually:

1. Disconnect the AC plug.
2. Remove the Top Case and Front Assembly.
3. Make sure that the Moving guide preparations are in the Eject Position.
4. Turn the LDG Belt in the appropriate direction shown in Fig. 5-4-1 until the Moving guide preparations come to the Eject Position. Stop turning when the preparations begin clicking or can not be moved further. However, the tape will be left wound around the cylinder.
5. Turn the LDG Belt in the appropriate direction continuously, and the cassette tape will be ejected. Allow a minute or two to complete this task.

B. Method to place the Cassette Holder in the tape-loaded position without a cassette tape

1. Disconnect the AC Plug.
2. Remove the Top Case and Front Assembly.
3. Turn the LDG Belt in the appropriate direction shown in Fig. 5-4-1. Release the locking tabs shown in Fig. 5-4-1 and continue turning the LDG Belt until the Cassette Holder comes to the tape-loaded position. Allow a minute or two to complete this task.



5-4-2 Tape Interchangeability Alignment

Note:

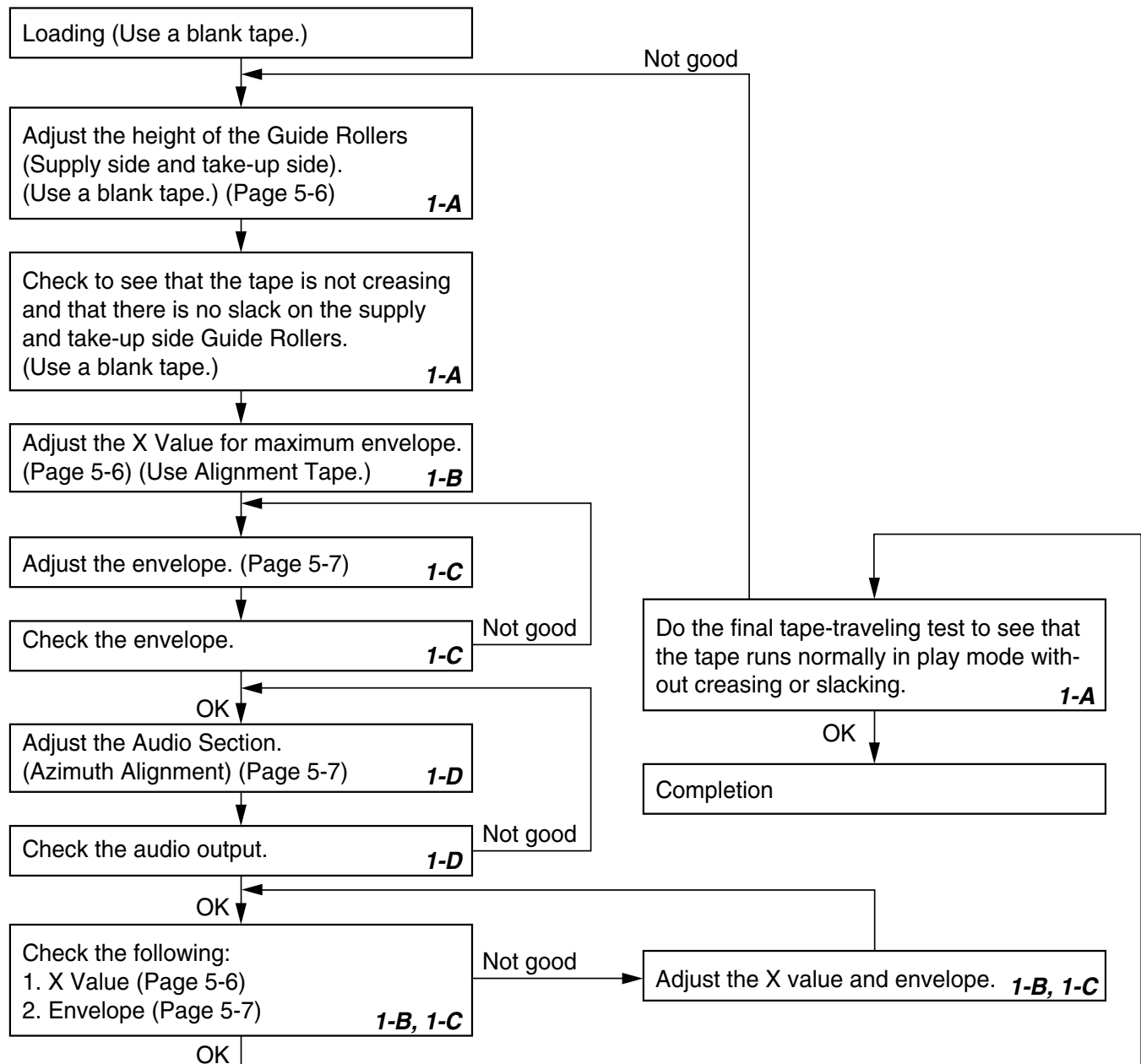
To do these alignment procedures, make sure that the Tracking Control Circuit is set to the center position every time a tape is loaded or unloaded. (Refer to page 5-7, procedure 1-C, step 2.)

Equipment required:

- Dual Trace Oscilloscope
- VHS Alignment Tape (MH-2)
- Guide Roller Adj. Screwdriver
- Flat Screwdriver (Purchase Locally)

Note: Before starting this Mechanical Alignment, do all Electrical Adjustment procedures.

Flowchart of Alignment for tape traveling



1-A. Preliminary/Final Checking and Alignment of Tape Path

Purpose:

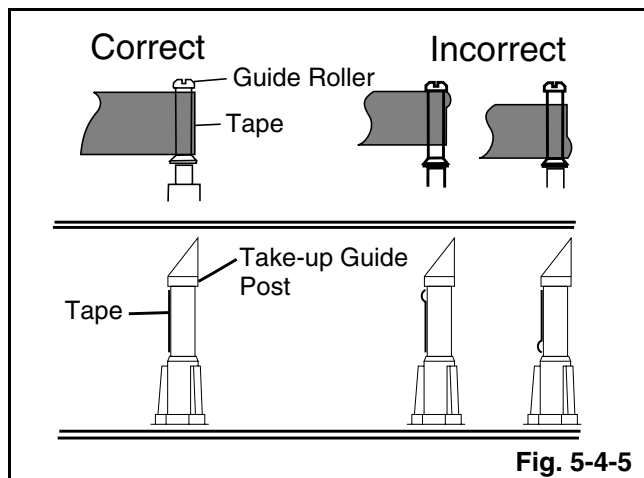
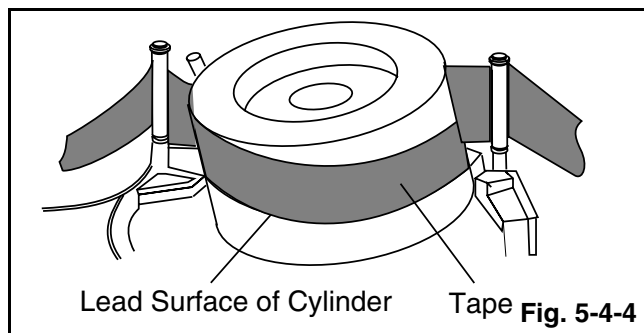
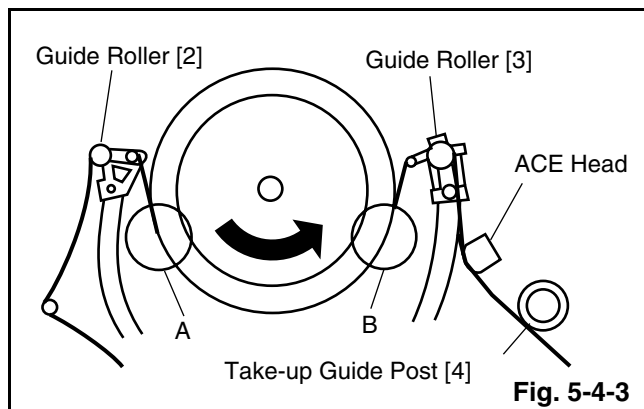
To make sure that the tape path is well stabilized.

Symptom of Misalignment:

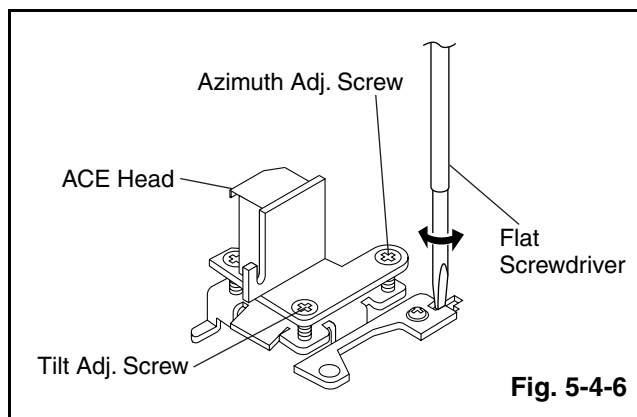
If the tape path is unstable, the tape will be damaged.

Note: Do not use an Alignment Tape for this procedure. If the unit is not correctly aligned, the tape may be damaged.

1. Playback a blank cassette tape and check to see that the tape runs without creasing at Guide Rollers [2] and [3], and at points A and B on the lead surface. (Refer to Fig. 5-4-3 and 5-4-4.)
2. If creasing is apparent, align the height of the guide rollers by turning the top of Guide Rollers [2] and [3] with a Guide Roller Adj. Screwdriver. (Refer to Fig. 5-4-3 and 5-4-5.)



3. Check to see that the tape runs without creasing at Take-up Guide Post [4] or without snaking between Guide Roller [3] and ACE Head. (Fig. 5-4-3 and 5-4-5)
4. If creasing or snaking is apparent, adjust the Tilt Adj. Screw of the ACE Head. (Fig. 5-4-6)



1-B. X Value Alignment

Purpose:

To align the Horizontal Position of the Audio/Control/Erase Head.

Symptom of Misalignment:

If the Horizontal Position of the Audio/Control/Erase Head is not properly aligned, maximum envelope cannot be obtained at the Neutral position of the Tracking Control Circuit.

1. Connect the oscilloscope to TP301 (C-PB) and TP501 (CTL) on the Main CBA. Use TP502 (RF-SW) as a trigger.
2. Playback the Gray Scale of the Alignment Tape (MH-2) and confirm that the PB FM signal is present.
3. Set the Tracking Control Circuit to the center position by pressing CH UP button then "PLAY" button on the unit. (Refer to note on bottom of page 5-7.)
4. Use the Flat Screwdriver so that the PB FM signal at TP301 (C-PB) is maximum. (Fig. 5-4-6)
5. Press CH UP button on the unit until the CTL waveform has shifted by approx. +2ms. Make sure that the envelope is simply attenuated (shrinks in height) during this process so that you will know the envelope has been at its peak.

6. Press CH DOWN button on the unit until the CTL waveform has shifted from its original position (not the position achieved in step 5, but the position of CTL waveform in step 4) by approximately -2ms. Make sure that the envelope is simply attenuated (shrinks in height) once CTL waveform passes its original position and is further brought in the minus direction.
7. Set the Tracking Control Circuit to the center position by pressing CH UP button and then "PLAY" button.

1-C. Checking/Adjustment of Envelope Waveform

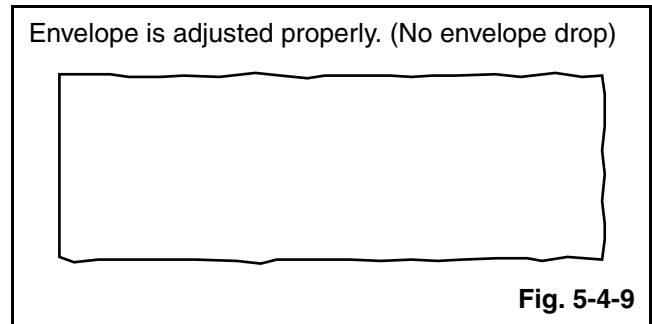
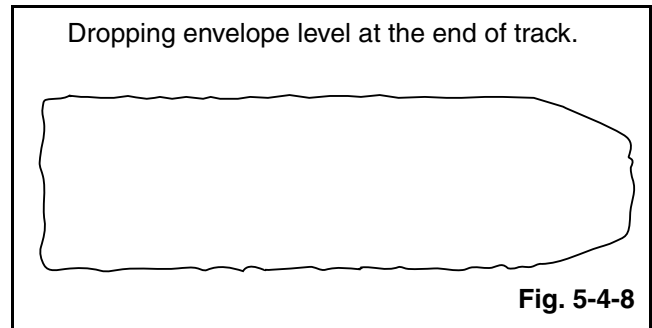
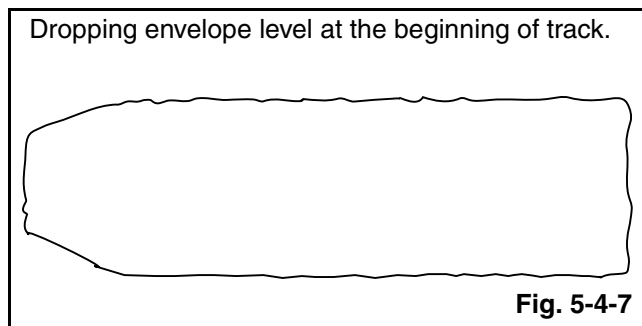
Purpose:

To achieve a satisfactory picture and precise tracking.

Symptom of Misalignment:

If the envelope output is poor, noise will appear in the picture. The tracking will then lose precision and the playback picture will be distorted by any slight variation of the Tracking Control Circuit.

1. Connect the oscilloscope to TP301 (C-PB) on the Main CBA. Use TP502 (RF-SW) as a trigger.
2. Playback the Gray Scale on the Alignment Tape (MH-2). Set the Tracking Control Circuit to the center position by pressing CH UP button and then "PLAY" button on the unit. Adjust the height of Guide Rollers [2] and [3] (Fig. 5-4-3, Page 5-6) watching the oscilloscope display so that the envelope becomes as flat as possible. To do this adjustment, turn the top of the Guide Roller with the Guide Roller Adj. Screwdriver.
3. If the envelope is as shown in Fig. 5-4-7, adjust the height of Guide Roller [2] (Refer to Fig. 5-4-3) so that the waveform looks like the one shown in Fig. 5-4-9.
4. If the envelope is as shown in Fig. 5-4-8, adjust the height of Guide Roller [3] (Refer to Fig. 5-4-3) so that the waveform looks like the one shown in Fig. 5-4-9.
5. When Guide Rollers [2] and [3] (Refer to Fig. 5-4-3) are aligned properly, there is no envelope drop either at the beginning or end of track as shown in Fig. 5-4-9.



Note: Upon completion of the adjustment of Guide Rollers [2] and [3] (Refer to Fig. 5-4-3), check the X Value by pushing the CH UP or DOWN buttons alternately, to check the symmetry of the envelope. Check the number of pushes to ensure center position. The number of pushes CH UP button to achieve 1/2 level of envelope should match the number of pushes CH DOWN button from center. If required, redo the "X Value Alignment."

1-D. Azimuth Alignment of Audio/Control/Erase Head

Purpose:

To correct the Azimuth alignment so that the Audio/Control/Erase Head meets tape tracks properly.

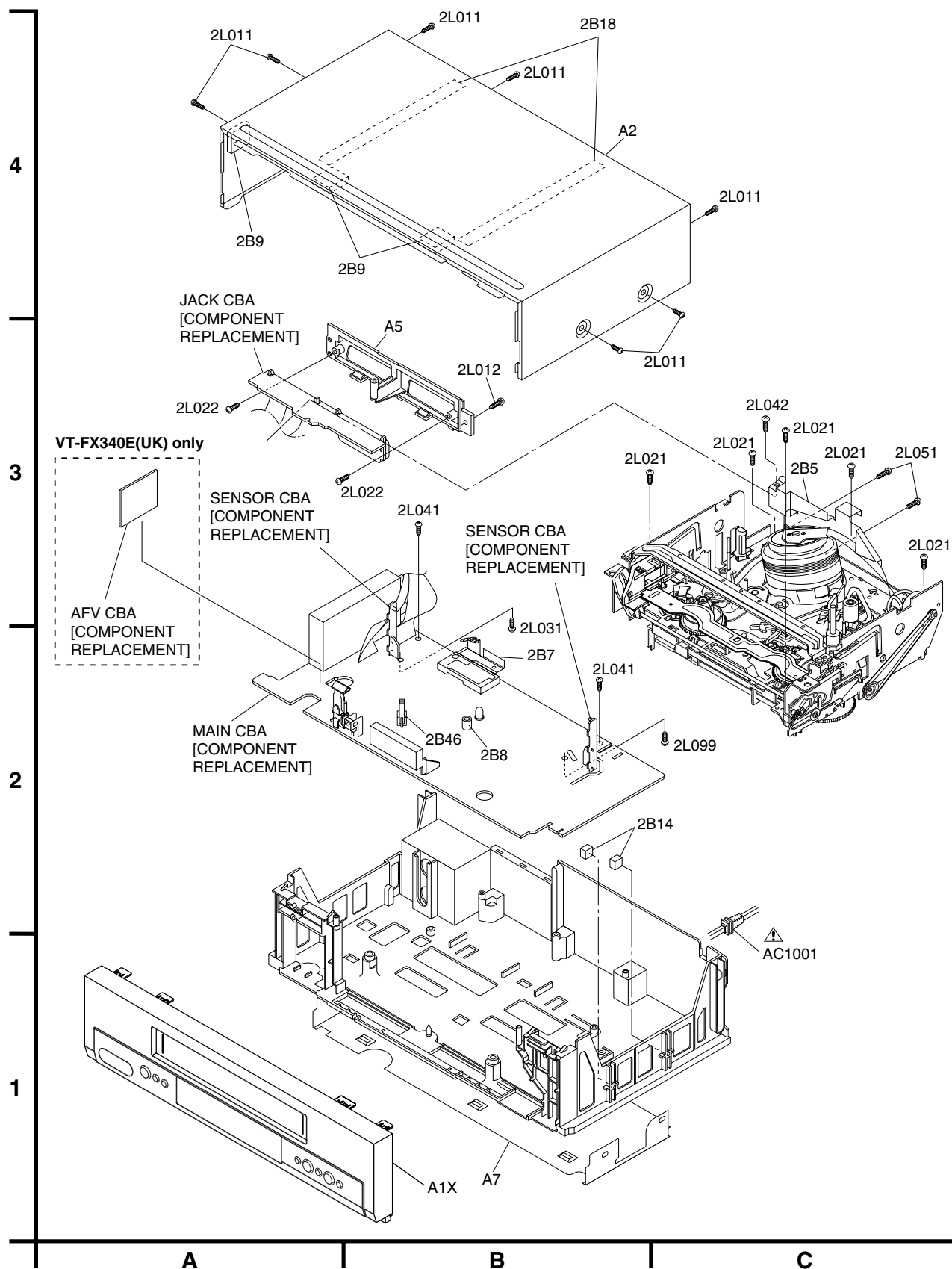
Symptom of Misalignment:

If the position of the Audio/Control/Erase Head is not properly aligned, the Audio S/N Ratio or Frequency Response will be poor.

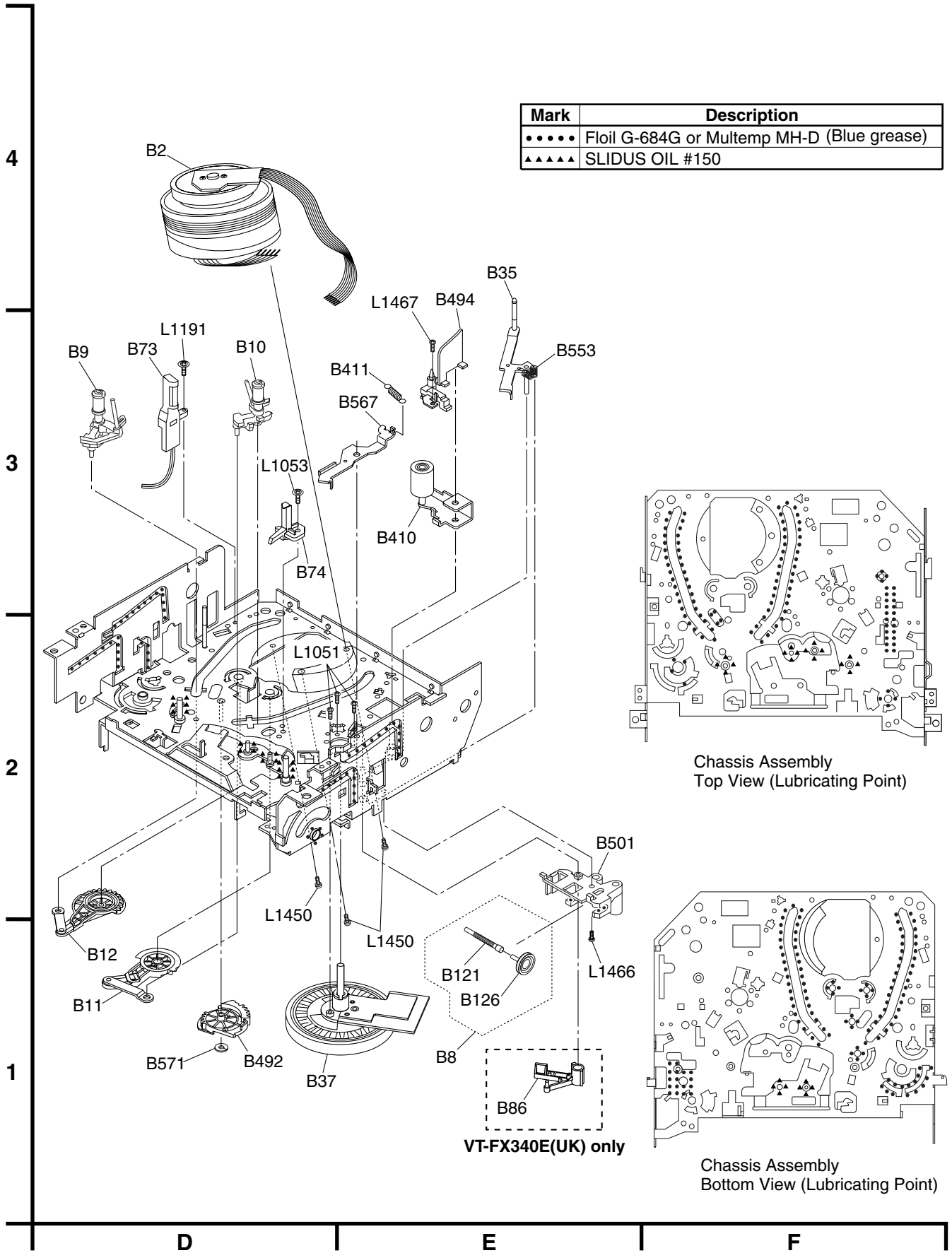
1. Connect the oscilloscope to the audio output jack on the rear side of the deck.
2. Playback the alignment tape (MH-2) and confirm that the audio signal output level is 8kHz.
3. Adjust Azimuth Adj. Screw so that the output level on the AC Voltmeter or the waveform on the oscilloscope is at maximum. (Fig. 5-4-6)

6-1 EXPLODED VIEWS

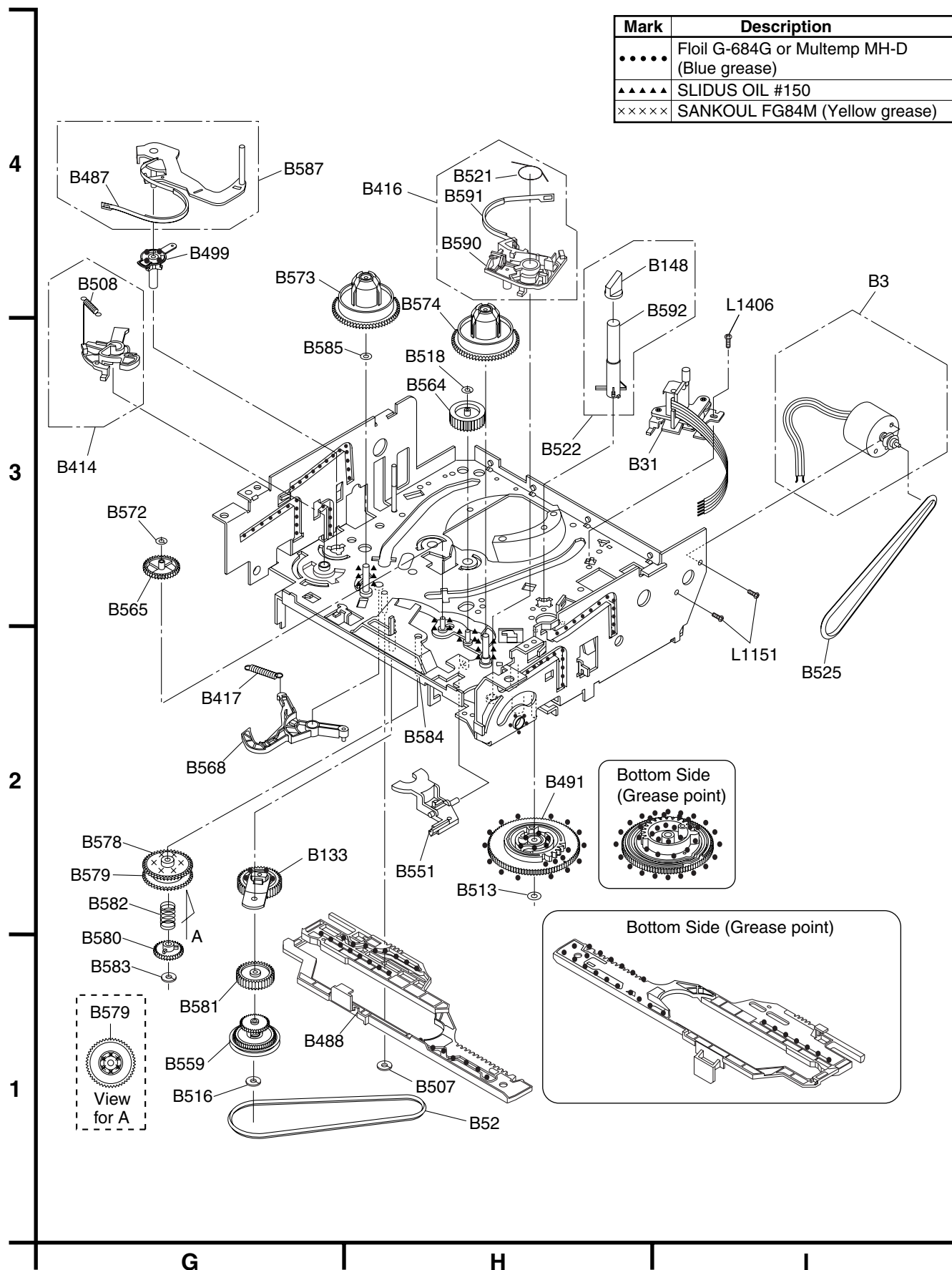
6-1-1 Cabinet Section



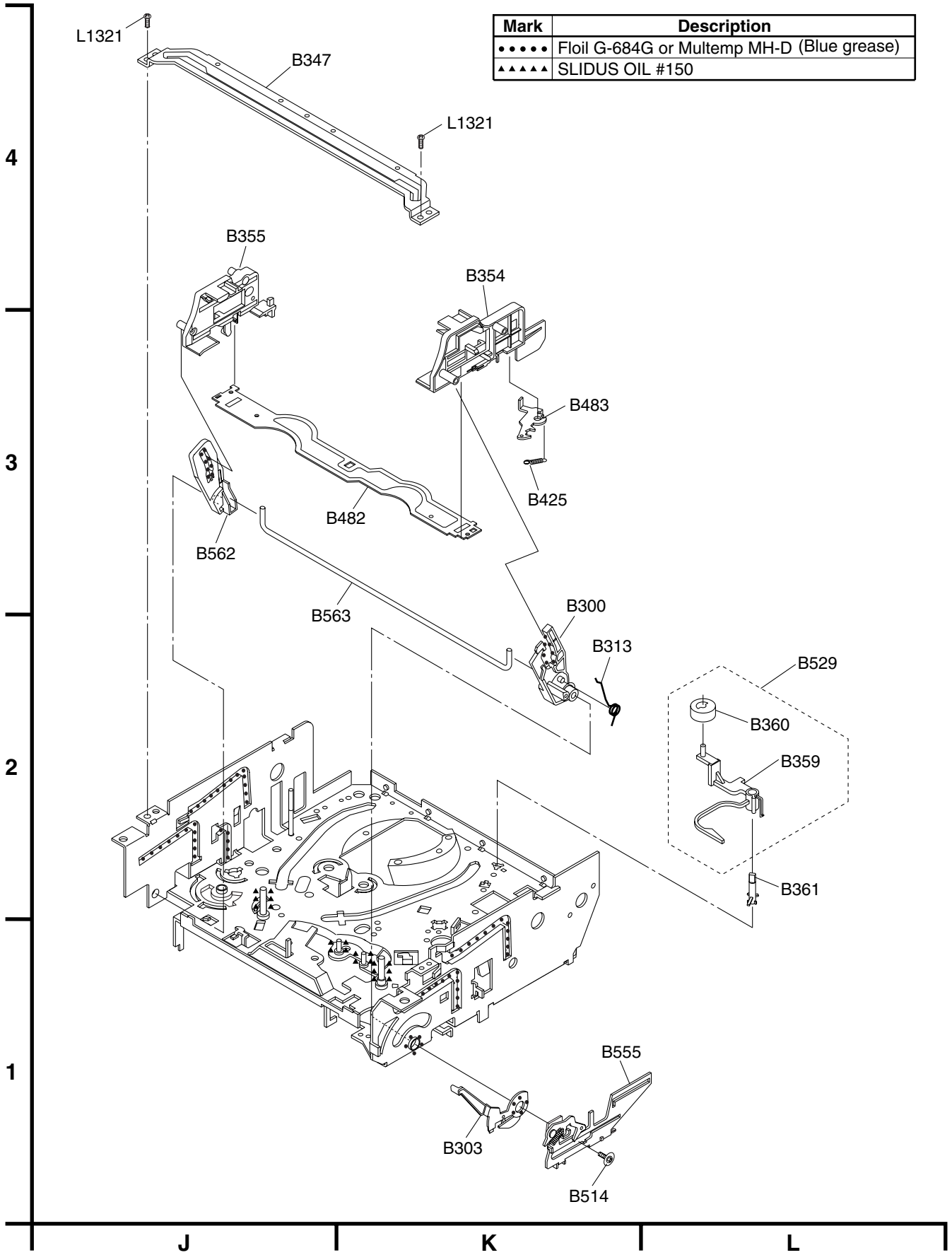
6-1-2 Deck Mechanism View 1 Section



6-1-3 Deck Mechanism View 2 Section



6-1-4 Deck Mechanism View 3 Section



**THE UPDATED PARTS LIST
FOR THIS MODEL IS
AVAILABLE ON ESTA**

1 SCHEMATIC DIAGRAMS / CBA'S AND TEST POINTS

Standard Notes

WARNING

Many electrical and mechanical parts in this chassis have special characteristics. These characteristics often pass unnoticed and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts that have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the mark "⚠" in the schematic diagram and the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts that do not have the same safety characteristics as specified in the parts list may create shock, fire, or other hazards.

Capacitor Temperature Markings

Mark	Capacity change rate	Standard temperature	Temperature range
(B)	±10%	20°C	-25~+85°C
(F)	+30 - 80%	20°C	-25~+85°C
(SR)	±15%	20°C	-25~+85°C
(Z)	+30 - 80%	20°C	-10~+70°C

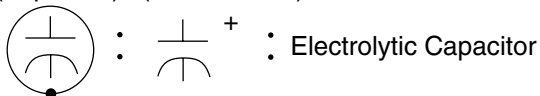
Notes:

1. Do not use the part number shown on these drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since these drawings were prepared.
2. All resistance values are indicated in ohms ($K=10^3$, $M=10^6$).
3. Resistor wattages are 1/4W or 1/6W unless otherwise specified.
4. All capacitance values are indicated in μF ($P=10^{-6} \mu F$).
5. All voltages are DC voltages unless otherwise specified.
6. Electrical parts such as capacitors, connectors, diodes, IC's, transistors, resistors, switches, and fuses are identified by four digits. The first two digits are not shown for each component. In each block of the diagram, there is a note such as shown below to indicate these abbreviated two digits.

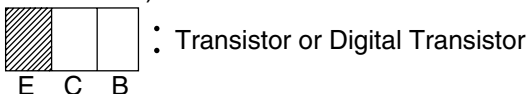
Capacitors and transistors are represented by the following symbols.

CBA Symbols

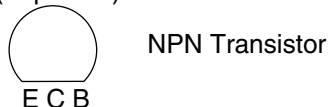
(Top View) (Bottom View)



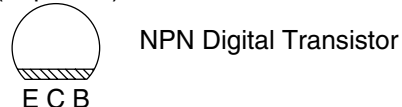
(Bottom View)



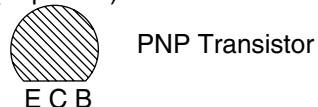
(Top View)



(Top View)



(Top View)

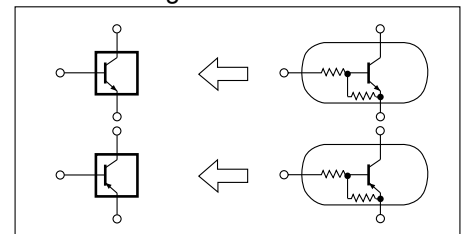


(Top View)



Schematic Diagram Symbols

Digital Transistor



LIST OF CAUTION, NOTES, AND SYMBOLS USED IN THE SCHEMATIC DIAGRAMS ON THE FOLLOWING PAGES:

1. CAUTION:

FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE.

2. CAUTION:

Fixed Voltage (or Auto voltage selectable) power supply circuit is used in this unit.

If Main Fuse (F1001) is blown, first check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

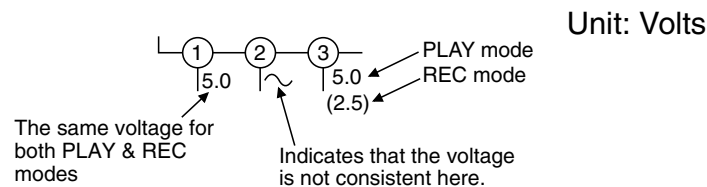
3. Note:

- (1) Do not use the part number shown on the drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since the drawings were prepared.
- (2) To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list section of the service manual.

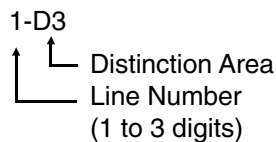
4. Wire Connectors

- (1) Prefix symbol "CN" means "connector" (can disconnect and reconnect).
- (2) Prefix symbol "CL" means "wire-solder holes of the PCB" (wire is soldered directly).

5. Voltage indications for PLAY and REC modes on the schematics are as shown below:

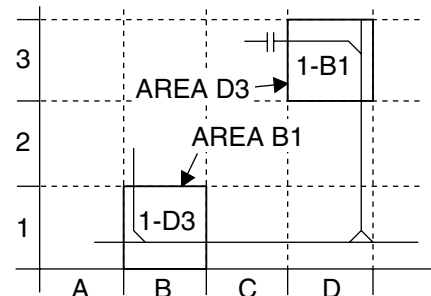


6. How to read converged lines



Examples:

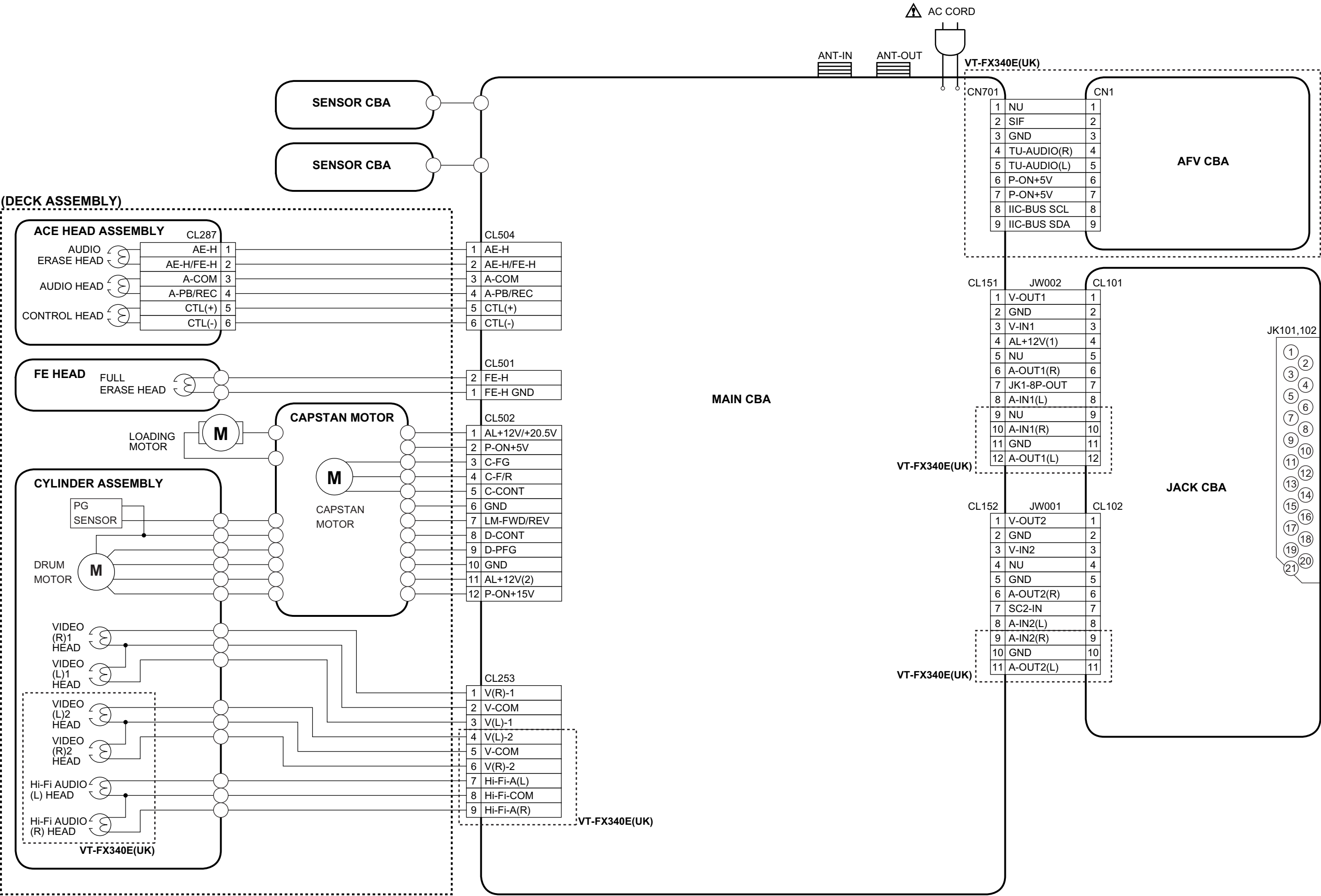
1. "1-D3" means that line number "1" goes to area "D3".
2. "1-B1" means that line number "1" goes to area "B1".



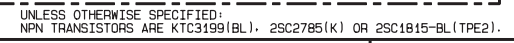
7. Test Point Information

- ⊙ : Indicates a test point with a jumper wire across a hole in the PCB.
- : Used to indicate a test point with a component lead on foil side.
- ⊘ : Used to indicate a test point with no test pin.
- : Used to indicate a test point with a test pin.

2 WIRING DIAGRAMS



4



4



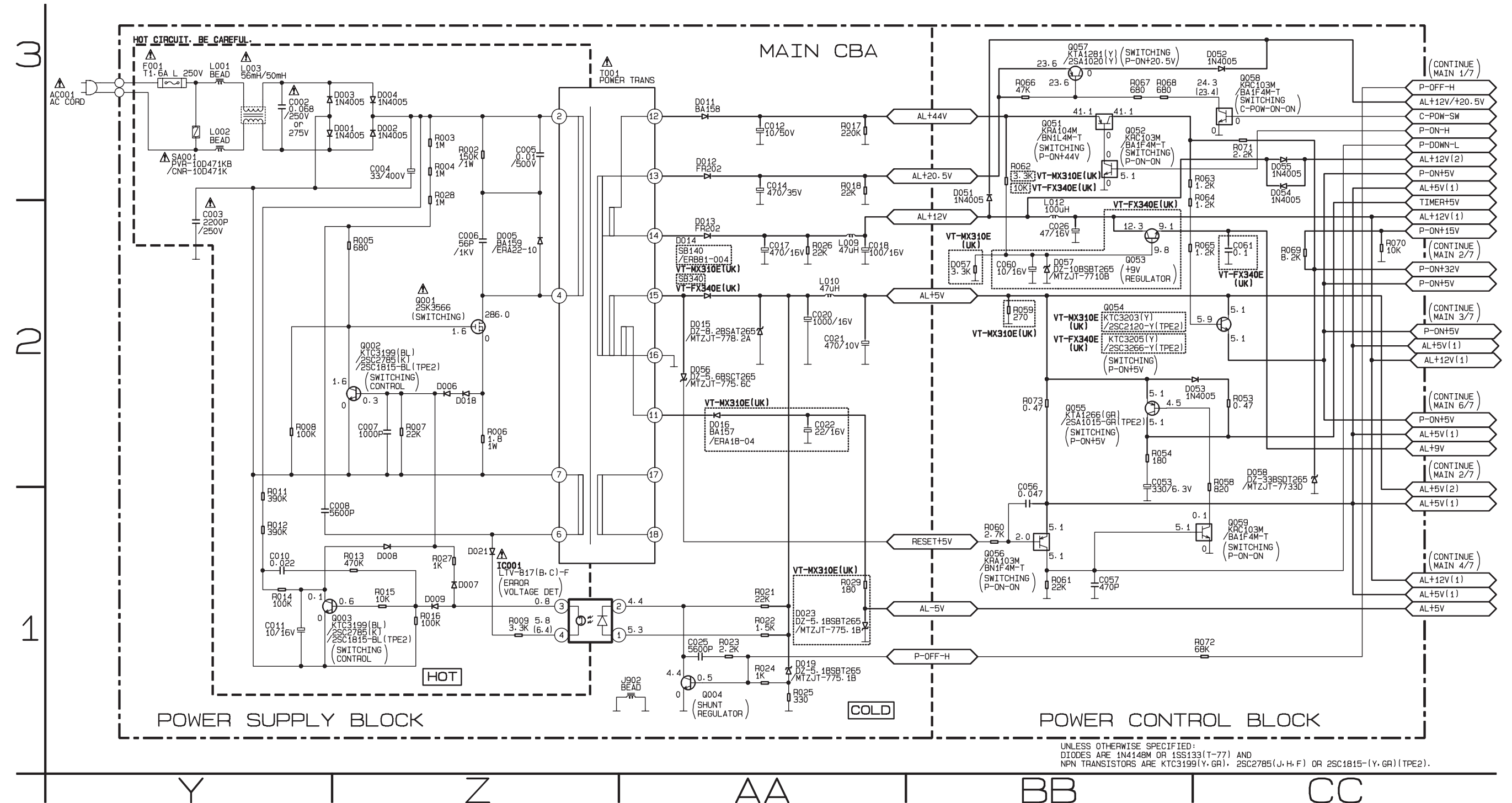
1



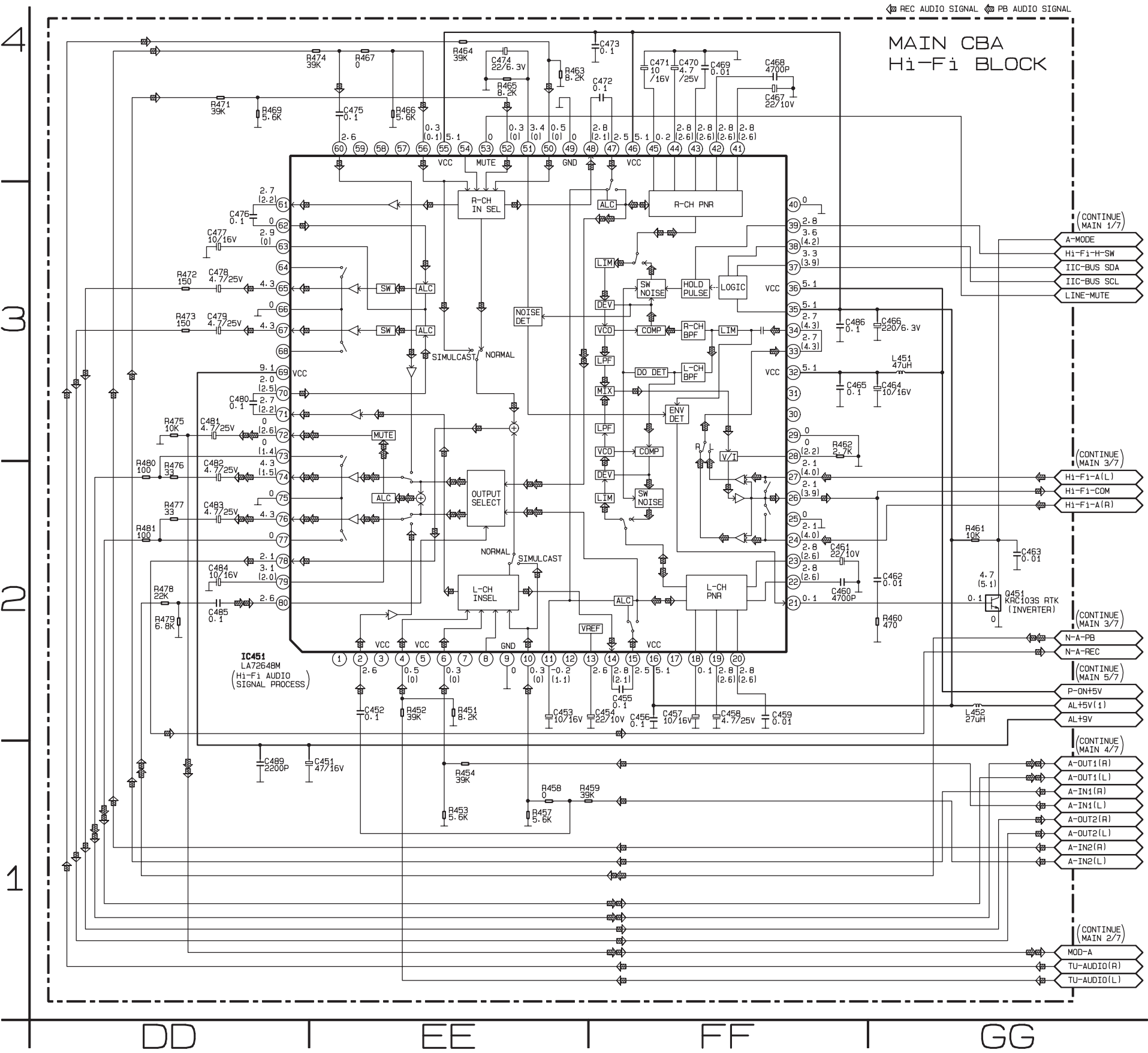
The schematic diagram illustrates the internal circuitry of the JACK BLOCK and JACK CBA sections. The JACK BLOCK section features a central IC151 (CD4052BCS-JX) configured as a 4-to-1 multiplexer, controlled by a 5.2V supply and a 0.7V supply. It includes various input and output pins, such as V-IN1, V-OUT1, V-IN2, V-OUT2, A-IN2, A-OUT, TU-AUDIO, and A-IN1. The circuit also includes several diodes (D153, D154, D155, D156), resistors (R151, R152, R153, R154, R155, R156), and capacitors (C151, C152, C153, C154, C155, C156). The JACK CBA section contains two 20-pin connectors, JK101 and JK102, which interface with the main circuit. It includes two VT-FX340E(UK) and two VT-MX310E(UK) components, along with various resistors (R101, R102, R103, R104, R105, R106, R107, R108, R109, R110, R111, R112, R113, R114, R115, R116, R117, R118, R119, R120, R121, R122, R123, R124, R125, R126, R127, R128, R129, R130, R131, R132, R133, R134, R135, R136, R137, R138, R139, R140, R141, R142, R143, R144, R145, R146, R147, R148, R149, R150, R151, R152, R153, R154, R155, R156, R157, R158, R159, R160, R161, R162, R163, R164, R165, R166, R167, R168, R169, R170, R171, R172, R173, R174, R175, R176, R177, R178, R179, R180, R181, R182, R183, R184, R185, R186, R187, R188, R189, R190, R191, R192, R193, R194, R195, R196, R197, R198, R199, R200, R201, R202, R203, R204, R205, R206, R207, R208, R209, R210, R211, R212, R213, R214, R215, R216, R217, R218, R219, R220, R221, R222, R223, R224, R225, R226, R227, R228, R229, R230, R231, R232, R233, R234, R235, R236, R237, R238, R239, R240, R241, R242, R243, R244, R245, R246, R247, R248, R249, R250, R251, R252, R253, R254, R255, R256, R257, R258, R259, R260, R261, R262, R263, R264, R265, R266, R267, R268, R269, R270, R271, R272, R273, R274, R275, R276, R277, R278, R279, R280, R281, R282, R283, R284, R285, R286, R287, R288, R289, R290, R291, R292, R293, R294, R295, R296, R297, R298, R299, R300, R301, R302, R303, R304, R305, R306, R307, R308, R309, R310, R311, R312, R313, R314, R315, R316, R317, R318, R319, R320, R321, R322, R323, R324, R325, R326, R327, R328, R329, R330, R331, R332, R333, R334, R335, R336, R337, R338, R339, R340, R341, R342, R343, R344, R345, R346, R347, R348, R349, R350, R351, R352, R353, R354, R355, R356, R357, R358, R359, R360, R361, R362, R363, R364, R365, R366, R367, R368, R369, R370, R371, R372, R373, R374, R375, R376, R377, R378, R379, R380, R381, R382, R383, R384, R385, R386, R387, R388, R389, R390, R391, R392, R393, R394, R395, R396, R397, R398, R399, R400, R401, R402, R403, R404, R405, R406, R407, R408, R409, R410, R411, R412, R413, R414, R415, R416, R417, R418, R419, R420, R421, R422, R423, R424, R425, R426, R427, R428, R429, R430, R431, R432, R433, R434, R435, R436, R437, R438, R439, R440, R441, R442, R443, R444, R445, R446, R447, R448, R449, R450, R451, R452, R453, R454, R455, R456, R457, R458, R459, R460, R461, R462, R463, R464, R465, R466, R467, R468, R469, R470, R471, R472, R473, R474, R475, R476, R477, R478, R479, R480, R481, R482, R483, R484, R485, R486, R487, R488, R489, R490, R491, R492, R493, R494, R495, R496, R497, R498, R499, R500, R501, R502, R503, R504, R505, R506, R507, R508, R509, R510, R511, R512, R513, R514, R515, R516, R517, R518, R519, R520, R521, R522, R523, R524, R525, R526, R527, R528, R529, R530, R531, R532, R533, R534, R535, R536, R537, R538, R539, R540, R541, R542, R543, R544, R545, R546, R547, R548, R549, R550, R551, R552, R553, R554, R555, R556, R557, R558, R559, R560, R561, R562, R563, R564, R565, R566, R567, R568, R569, R570, R571, R572, R573, R574, R575, R576, R577, R578, R579, R580, R581, R582, R583, R584, R585, R586, R587, R588, R589, R590, R591, R592, R593, R594, R595, R596, R597, R598, R599, R600, R601, R602, R603, R604, R605, R606, R607, R608, R609, R610, R611, R612, R613, R614, R615, R616, R617, R618, R619, R620, R621, R622, R623, R624, R625, R626, R627, R628, R629, R630, R631, R632, R633, R634, R635, R636, R637, R638, R639, R640, R641, R642, R643, R644, R645, R646, R647, R648, R649, R650, R651, R652, R653, R654, R655, R656, R657, R658, R659, R660, R661, R662, R663, R664, R665, R666, R667, R668, R669, R670, R671, R672, R673, R674, R675, R676, R677, R678, R679, R680, R681, R682, R683, R684, R685, R686, R687, R688, R689, R690, R691, R692, R693, R694, R695, R696, R697, R698, R699, R700, R701, R702, R703, R704, R705, R706, R707, R708, R709, R710, R711, R712, R713, R714, R715, R716, R717, R718, R719, R720, R721, R722, R723, R724, R725, R726, R727, R728, R729, R730, R731, R732, R733, R734, R735, R736, R737, R738, R739, R740, R741, R742, R743, R744, R745, R746, R747, R748, R749, R750, R751, R752, R753, R754, R755, R756, R757, R758, R759, R760, R761, R762, R763, R764, R765, R766, R767, R768, R769, R770, R771, R772, R773, R774, R775, R776, R777, R778, R779, R780, R781, R782, R783, R784, R785, R786, R787, R788, R789, R790, R791, R792, R793, R794, R795, R796, R797, R798, R799, R800, R801, R802, R803, R804, R805, R806, R807, R808, R809, R810, R811, R812, R813, R814, R815, R816, R817, R818, R819, R820, R821, R822, R823, R824, R825, R826, R827, R828, R829, R830, R831, R832, R833, R834, R835, R836, R837, R838, R839, R840, R841, R842, R843, R844, R845, R846, R847, R848, R849, R850, R851, R852, R853, R854, R855, R856, R857, R858, R859, R

8

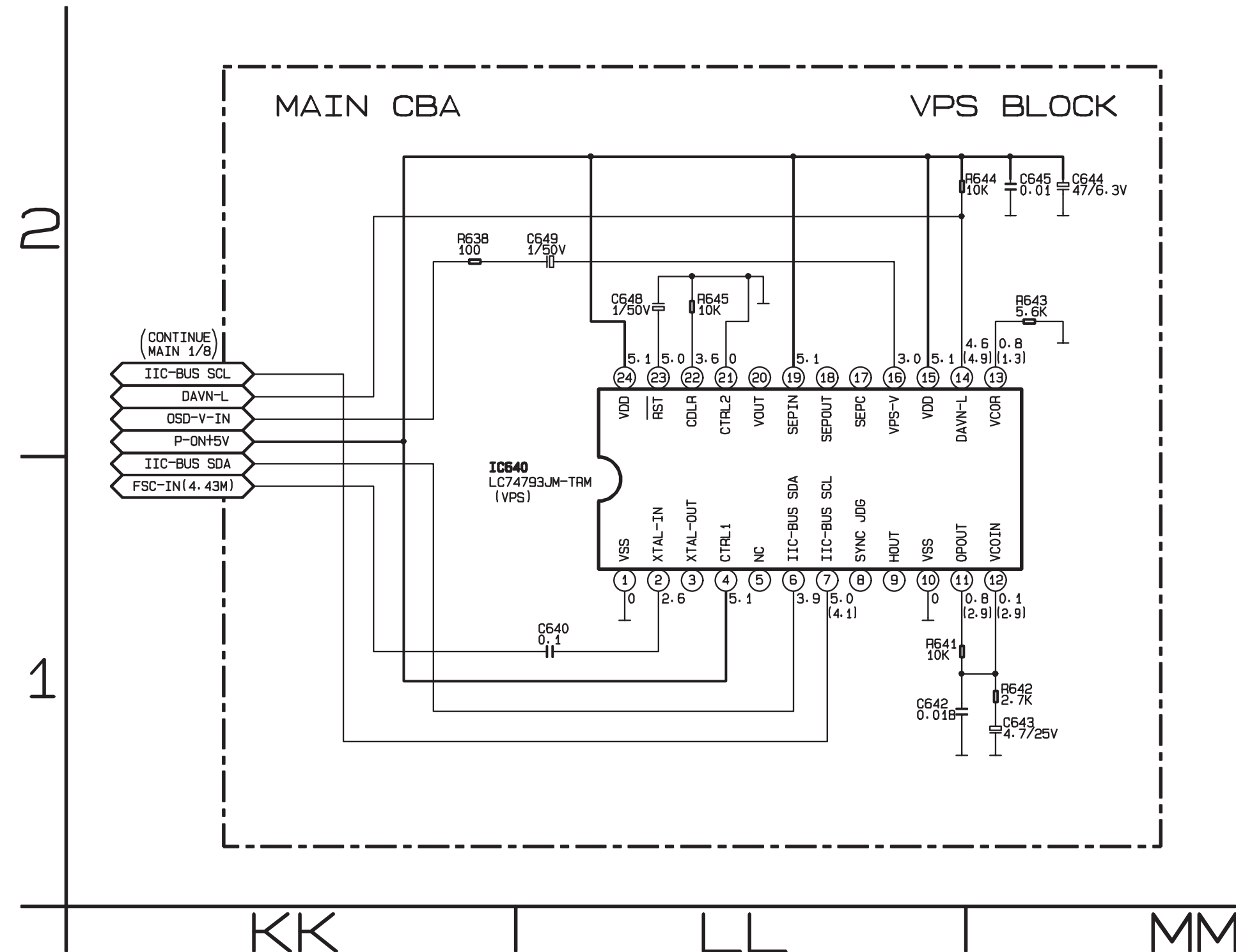
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit. If Main Fuse (F1001) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.



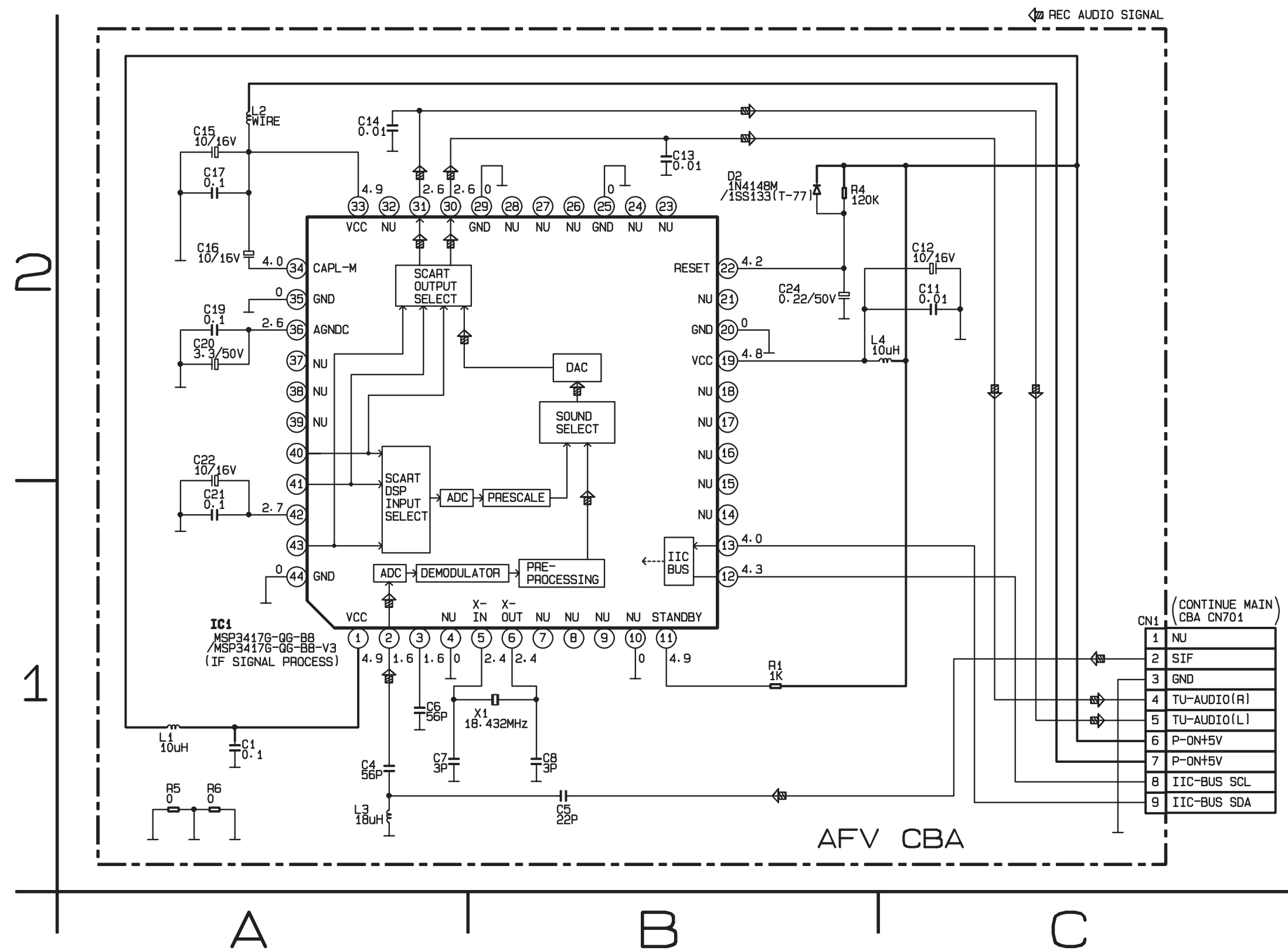
3-6 Main 6/7 Schematic Diagram (VT-FX340E(UK))



3-7 Main 7/7 Schematic Diagram



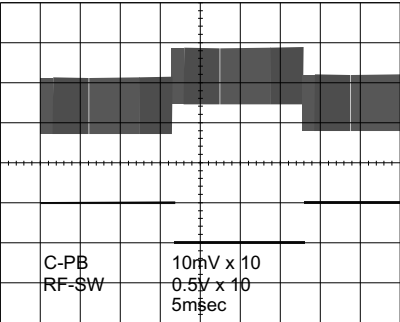
3-8 AFV Schematic Diagram (VT-FX340E(UK))



4 WAVEFORMS

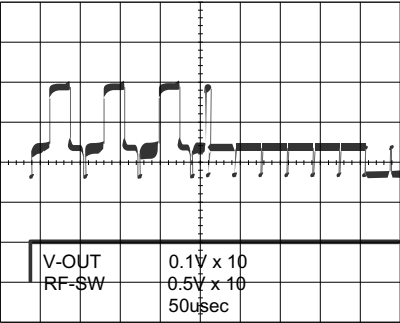
WF2 UPPER (TP301 of Main CBA)

WF1 LOWER (TP502 of Main CBA)

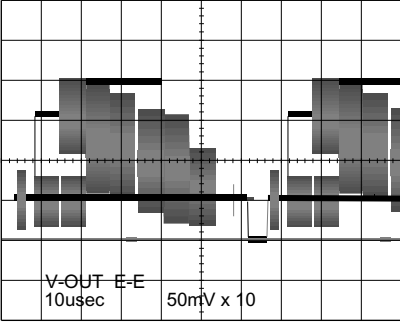


WF3 UPPER (J23 of Main CBA)

WF1 LOWER (TP502 of Main CBA)



WF3 (J23 of Main CBA)



5 CIRCUIT BOARD DIAGRAMS

5-1 Main CBA Top View & Sensor CBA Top View

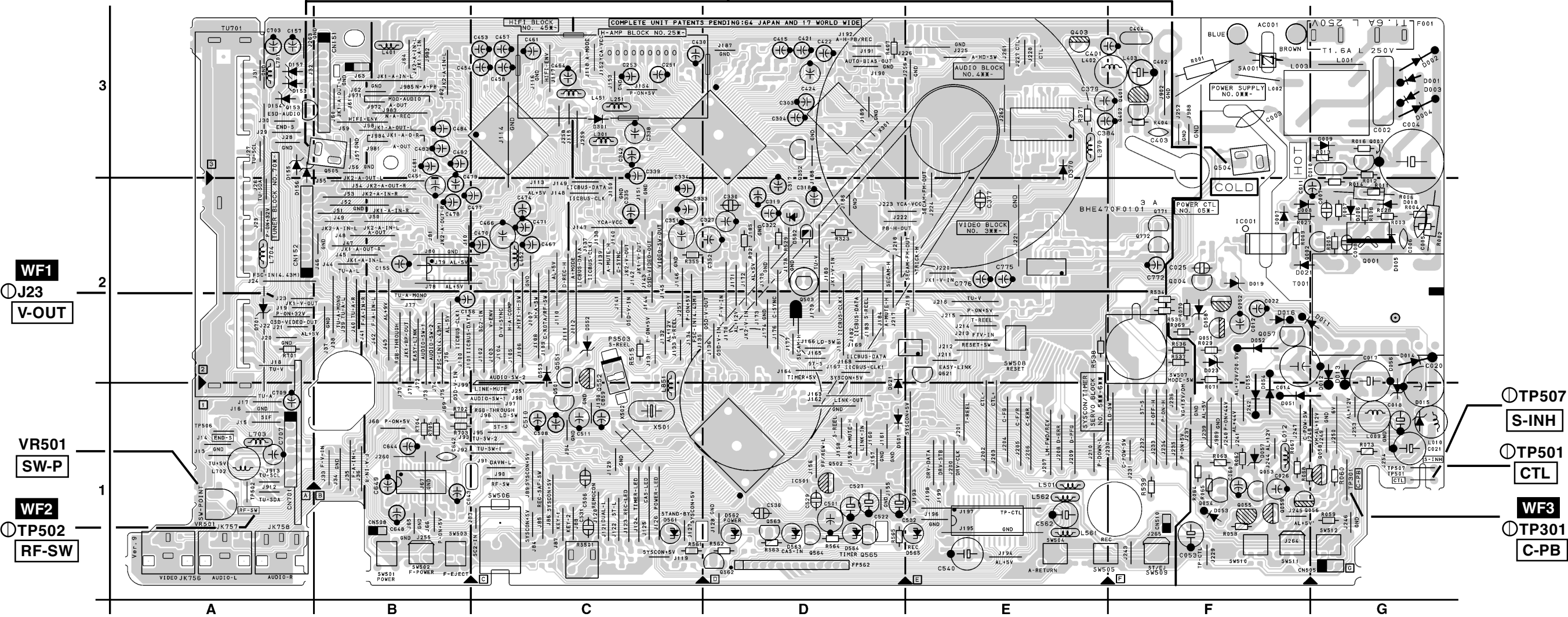
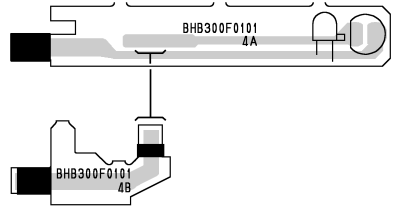
CAUTION !
For continued protection against fire hazard,
replace only with the same type fuse.

NOTE :
The voltage for parts in hot circuit is measured
using hot GND as a common terminal.

CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F1001) is blown, check to see that all components in the power supply
circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.

**BECAUSE A HOT CHASSIS GROUND IS PRESENT IN THE POWER
SUPPLY CIRCUIT , AN ISOLATION TRANSFORMER MUST BE USED.
ALSO , IN ORDER TO HAVE THE ABILITY TO INCREASE THE INPUT
SLOWLY , WHEN TROUBLESHOOTING THIS TYPE POWER SUPPLY
CIRCUIT , A VARIABLE ISOLATION TRANSFORMER IS REQUIRED.**

Sensor CBA Top View



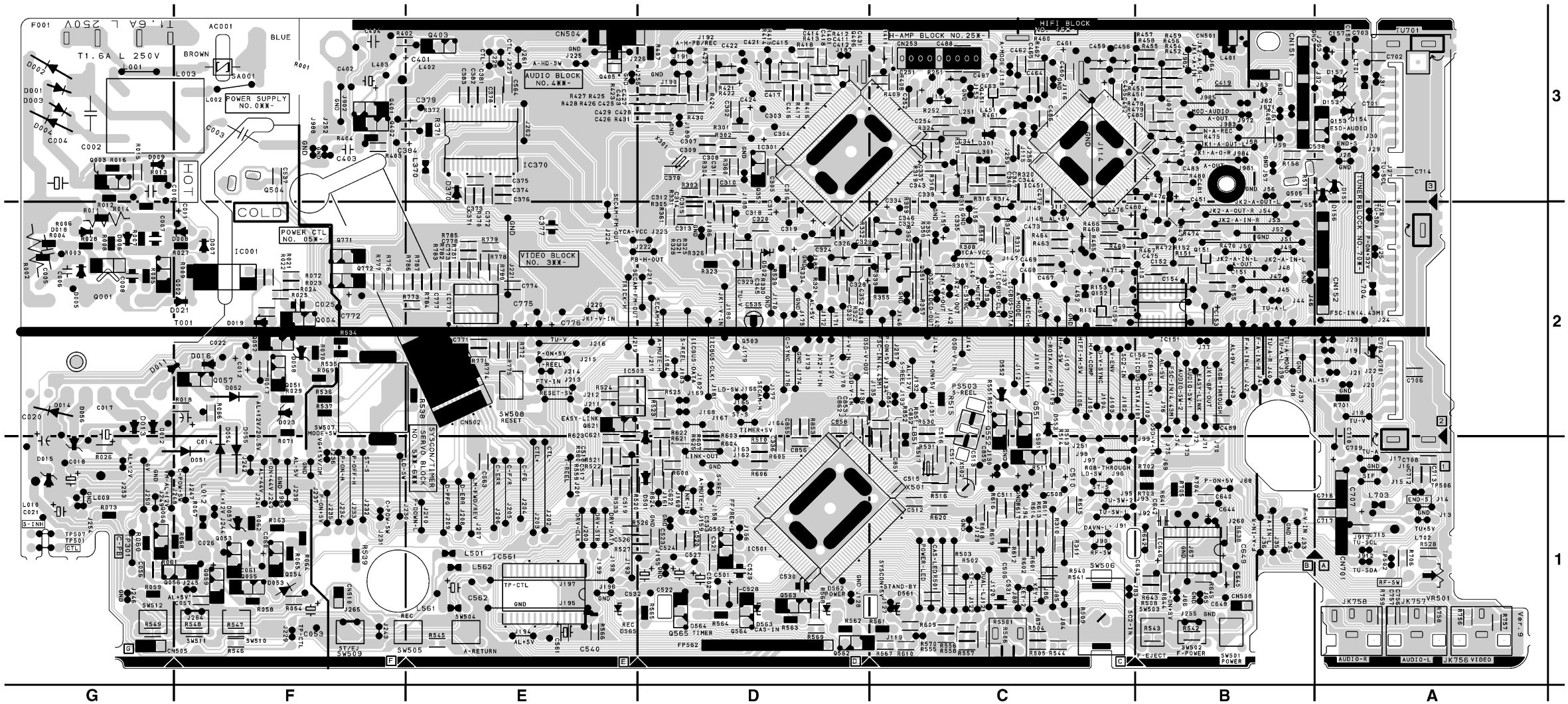
5-2 Main CBA Bottom View

CAUTION !
For continued protection against fire hazard,
replace only with the same type fuse.

NOTE :
The voltage for parts in hot circuit is measured
using hot GND as a common terminal.

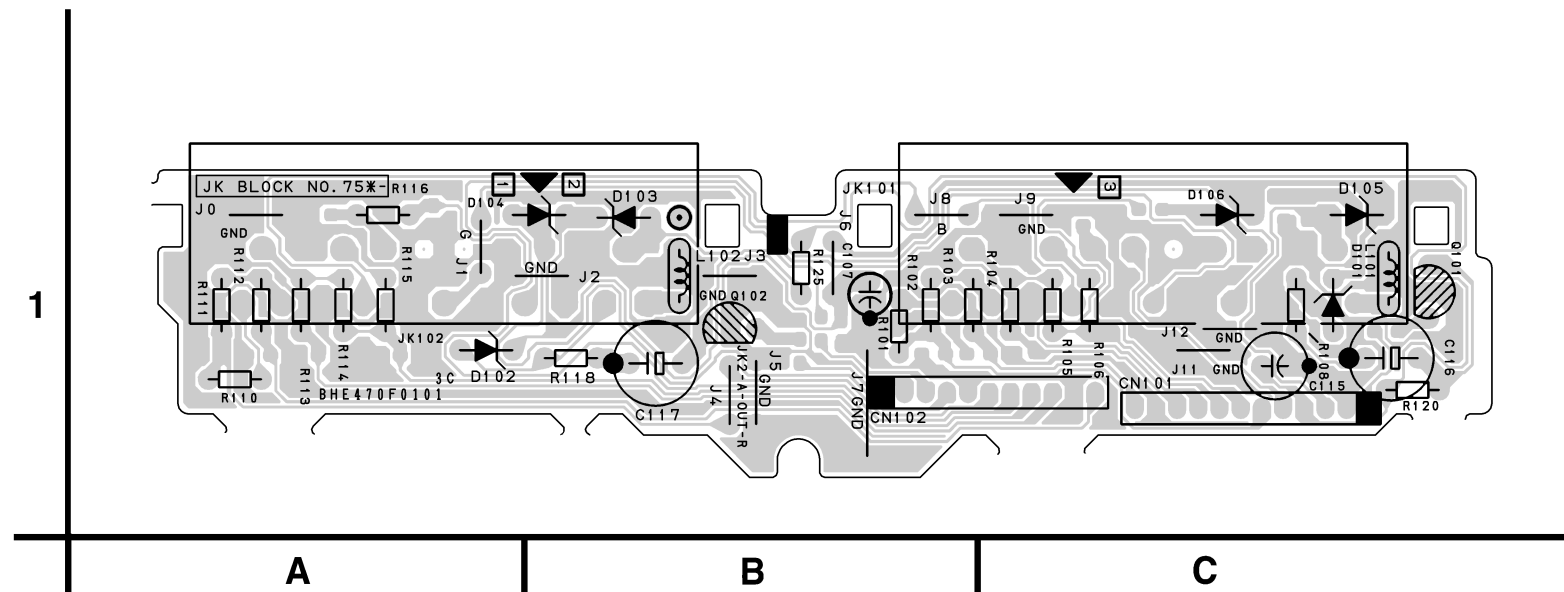
CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F1001) is blown, check to see that all components in the power supply
circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.

**BECAUSE A HOT CHASSIS GROUND IS PRESENT IN THE POWER
SUPPLY CIRCUIT , AN ISOLATION TRANSFORMER MUST BE USED.
ALSO , IN ORDER TO HAVE THE ABILITY TO INCREASE THE INPUT
SLOWLY , WHEN TROUBLESHOOTING THIS TYPE POWER SUPPLY
CIRCUIT , A VARIABLE ISOLATION TRANSFORMER IS REQUIRED.**

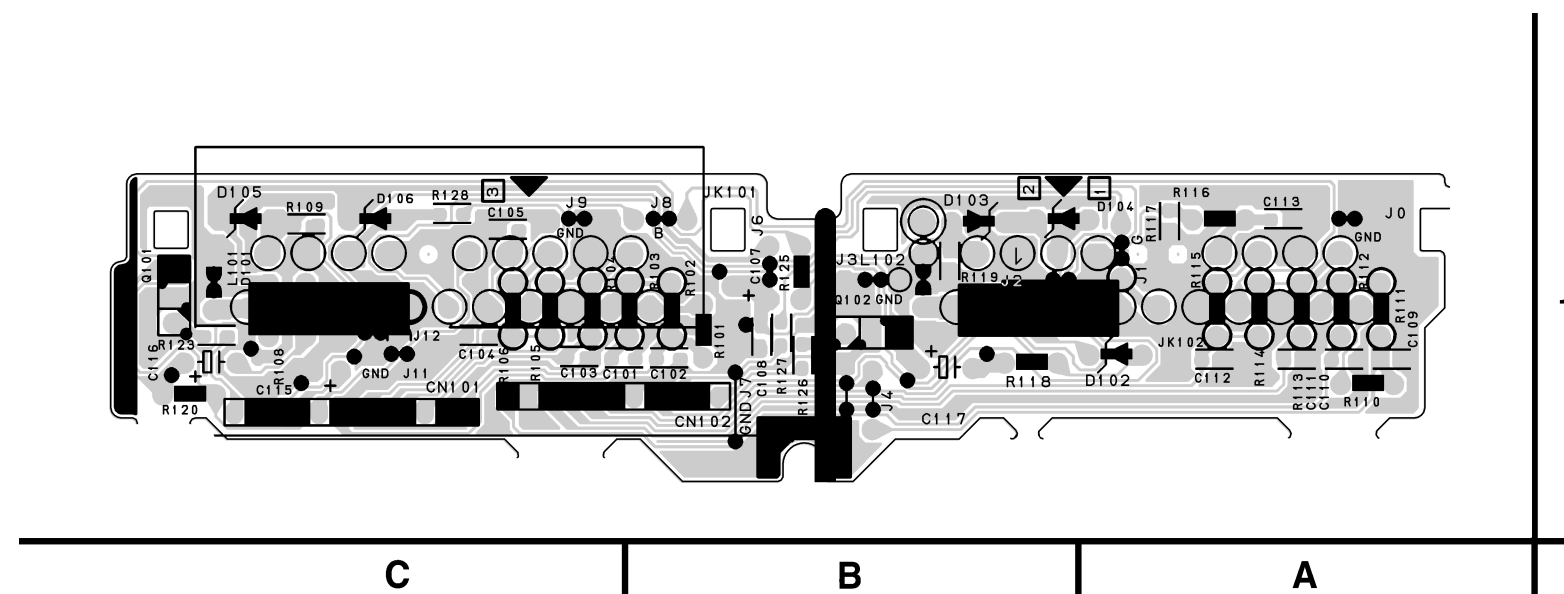


5-3 Jack CBA Top / Bottom View

Jack CBA Top View

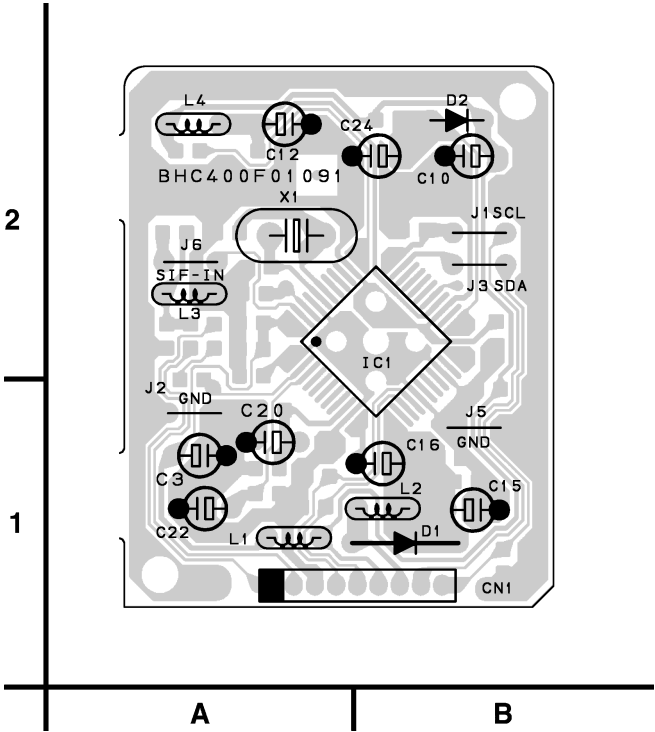


Jack CBA Bottom View

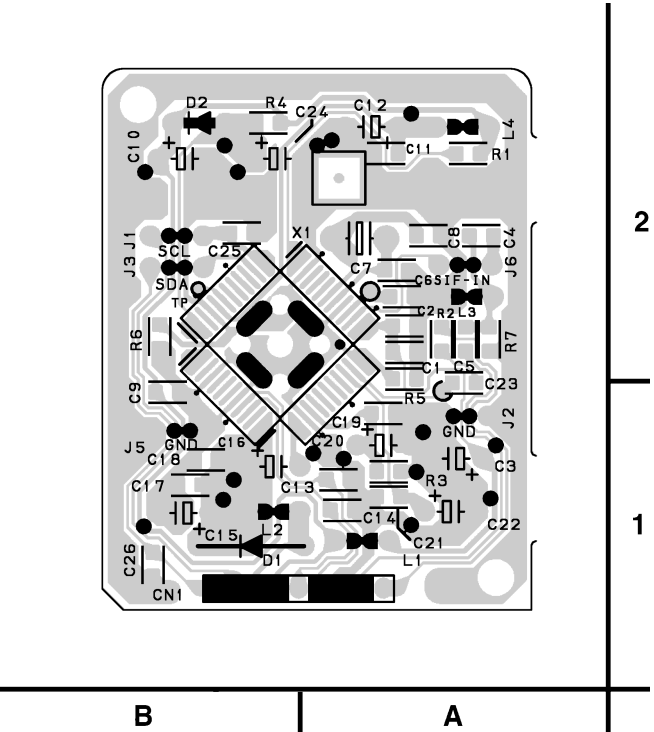


5-4 AFV CBA Top / Bottom View (VT-FX340E(UK))

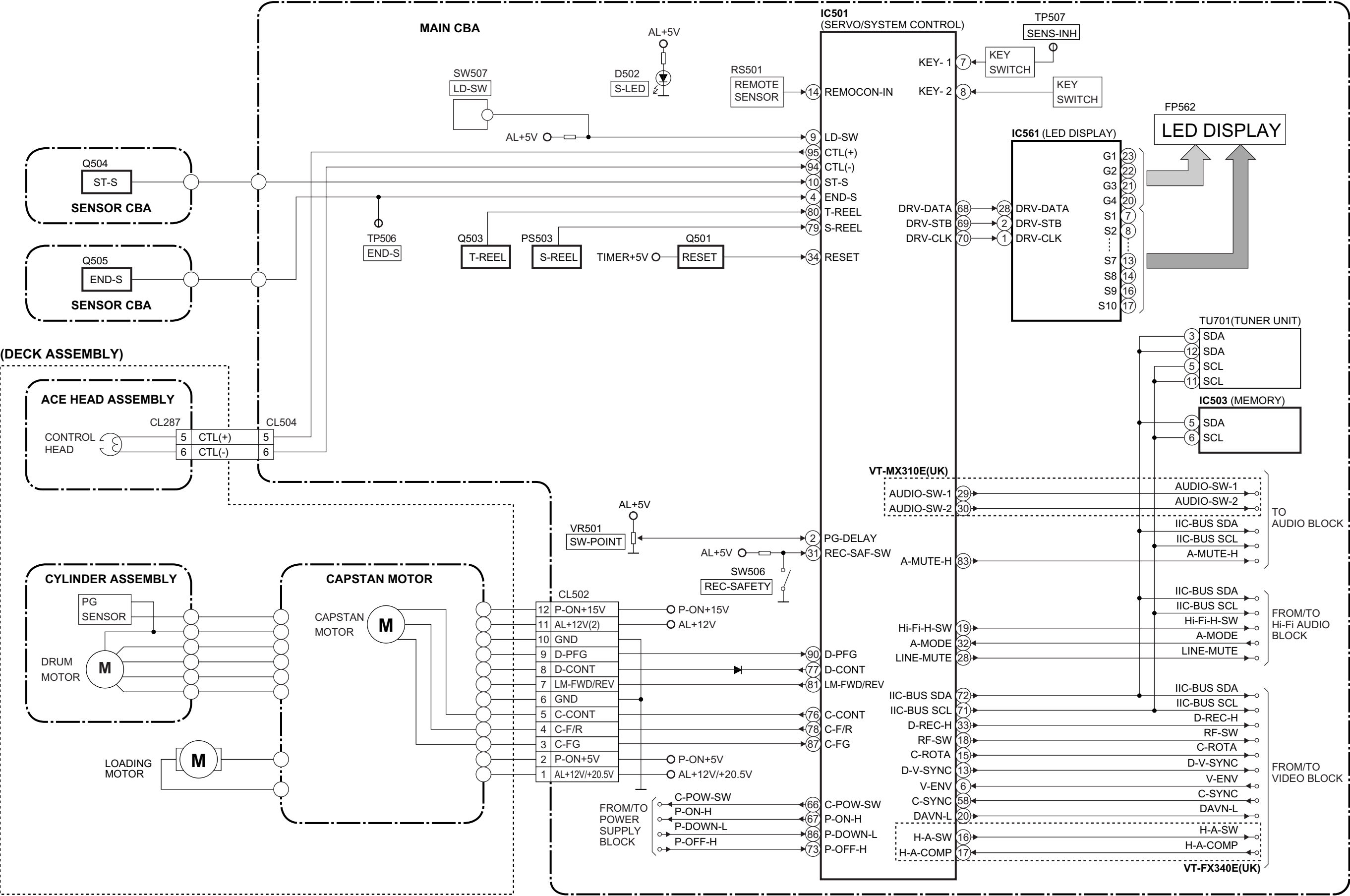
AFV CBA Top View



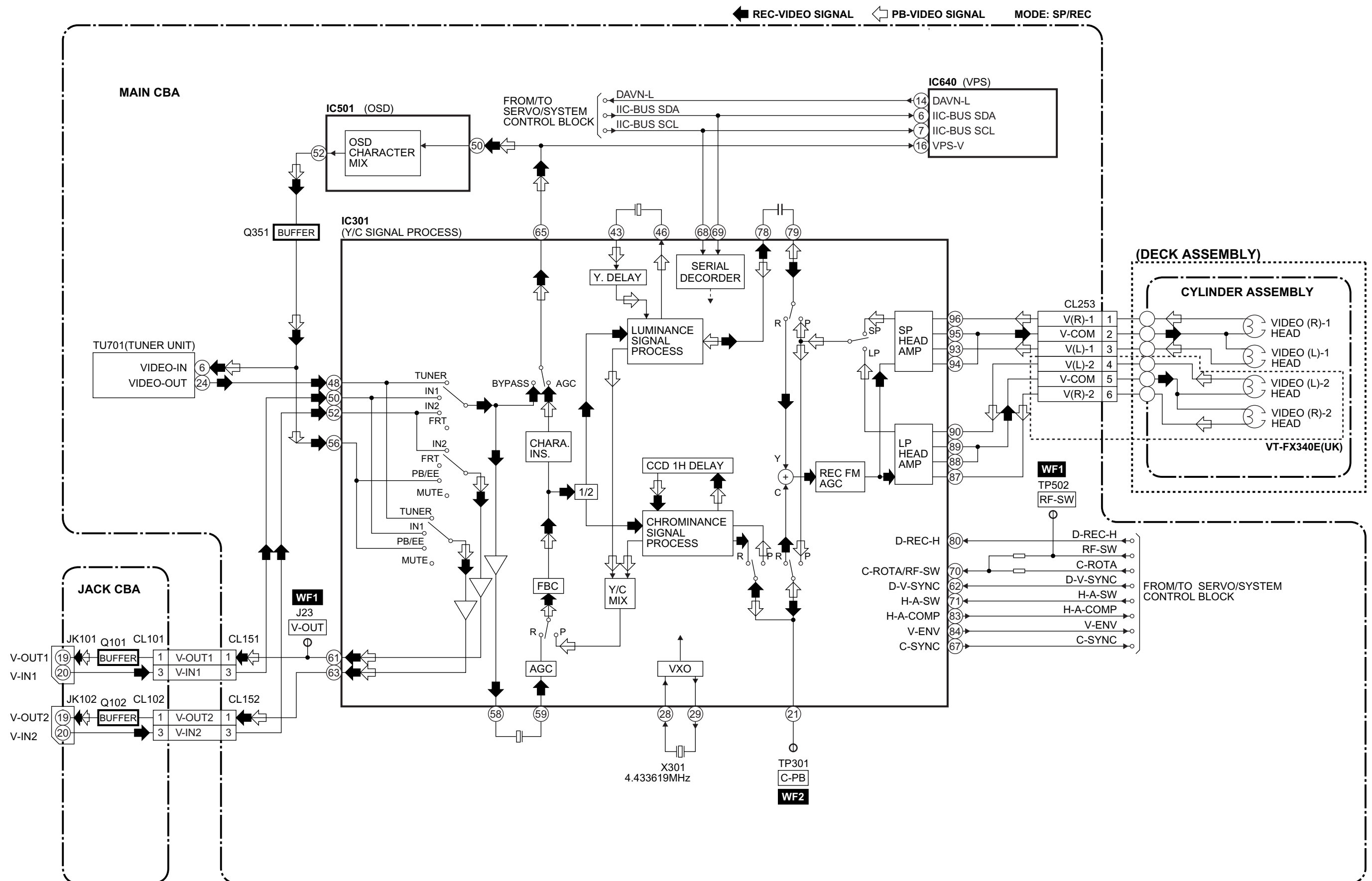
AFV CBA Bottom View



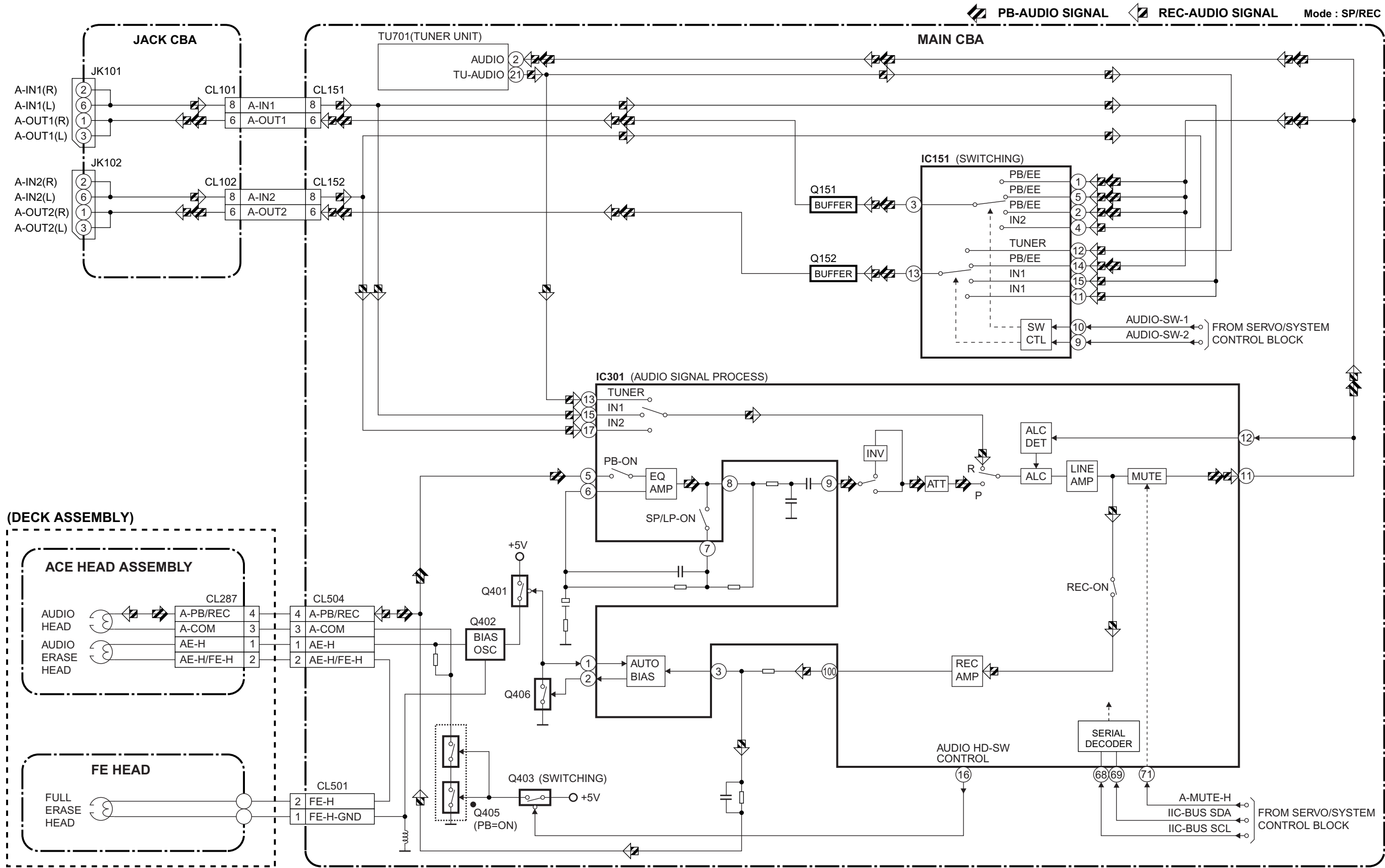
6 BLOCK DIAGRAMS
6-1 Servo/System Control Block Diagram



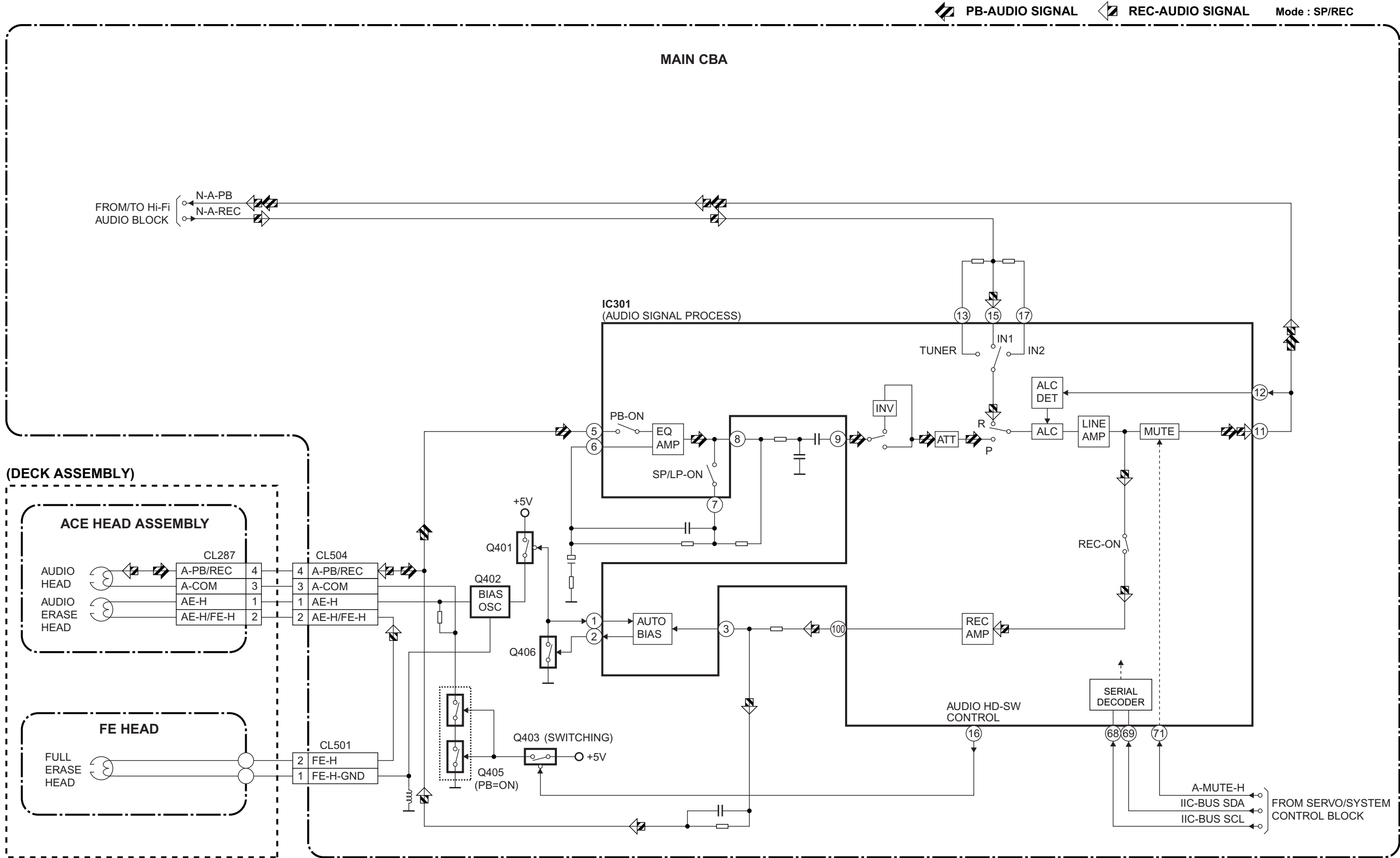
6-2 Video Block Diagram



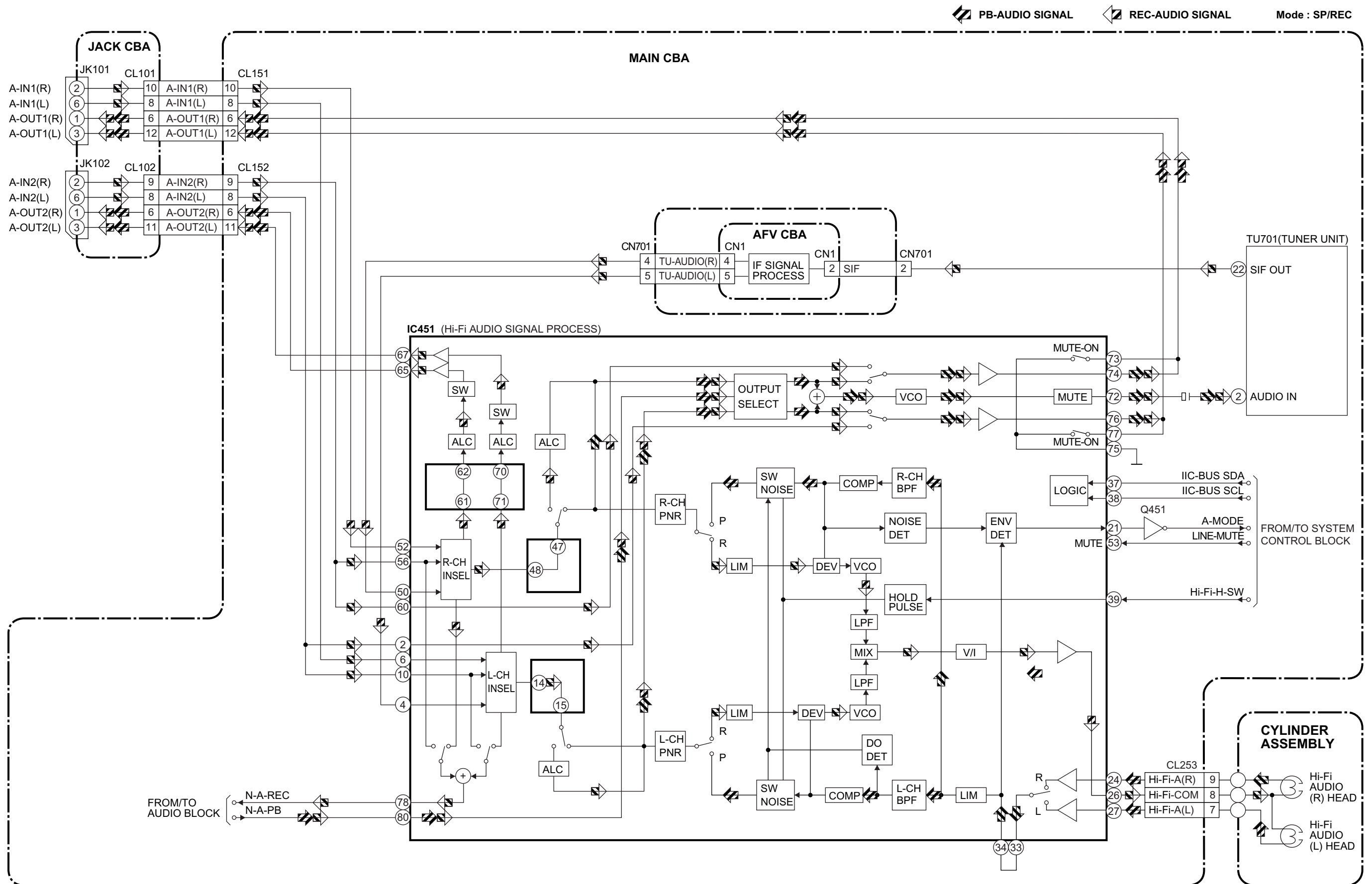
6-3 Audio Block Diagram (VT-MX310E(UK))



6-4 Audio Block Diagram (VT-FX340E(UK))



6-5 Hi-Fi Audio Block Diagram (VT-FX340E(UK))

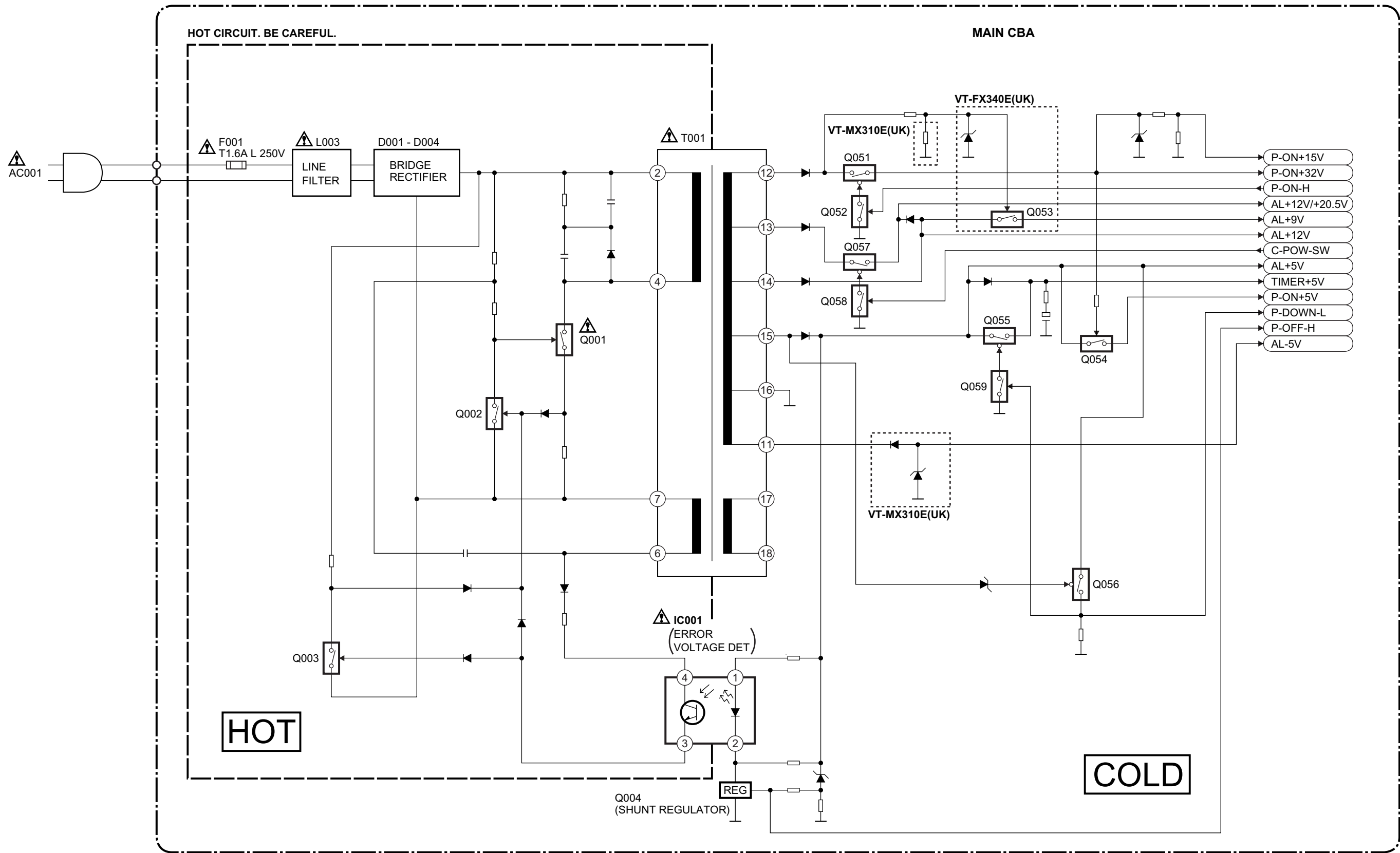


6-6 Power Supply Block Diagram

NOTE :
The voltage for parts in hot circuit is measured using
hot GND as a common terminal.

CAUTION
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE T1.6AL/250V FUSE.

CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F001) is blown, check to see that all components in the power supply
circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.



7 SYSTEM CONTROL TIMING CHARTS

Mode SW : LD-SW

LD-SW Position detection A/D Input voltage Limit (Calculated voltage)	Symbol
3.76V~4.50V (4.12V)	EJ
4.51V~5.00V (5.00V)	CL
0.00V~0.25V (0.00V)	SB
1.06V~1.50V (1.21V)	TL
0.66V~1.05V (0.91V)	FB
1.99V~2.60V (2.17V)	SF
1.51V~1.98V (1.80V)	SM
3.20V~3.75V (3.40V)	AU
0.26V~0.65V (0.44V)	AL
4.51V~5.00V (5.00V)	SS
2.61V~3.19V (2.97V)	RS

↑ Note:

Note:

EJ → RS: Loading FWD (LM-FWD/REV “H”)

RS → EJ: Loading REV (LM-FWD/REV “L”)

Stop (A) = Loading

Stop (B) = Unloading

Note:

Symbol	Loading Status
EJ	Eject
CL	Eject ~ REW Reel
SB	REW Reel ~ Stop(B)
TL	Stop(B) ~ Brake Cancel
FB	Brake Cancel ~ FF / REW
SF	FF / REW ~ Stop(M), (FF / REW)
SM	Stop(M), (FF / REW) ~ Stop(A)
AU	Stop(A) ~ Play / REC
AL	Play / REC ~ Still / Slow
SS	Still / Slow ~ RS (REW Search)
RS	RS (REW Search)

[VT-FX340E(UK)]

Still/Slow Control
Frame Advance Timing Chart

1) SP Mode

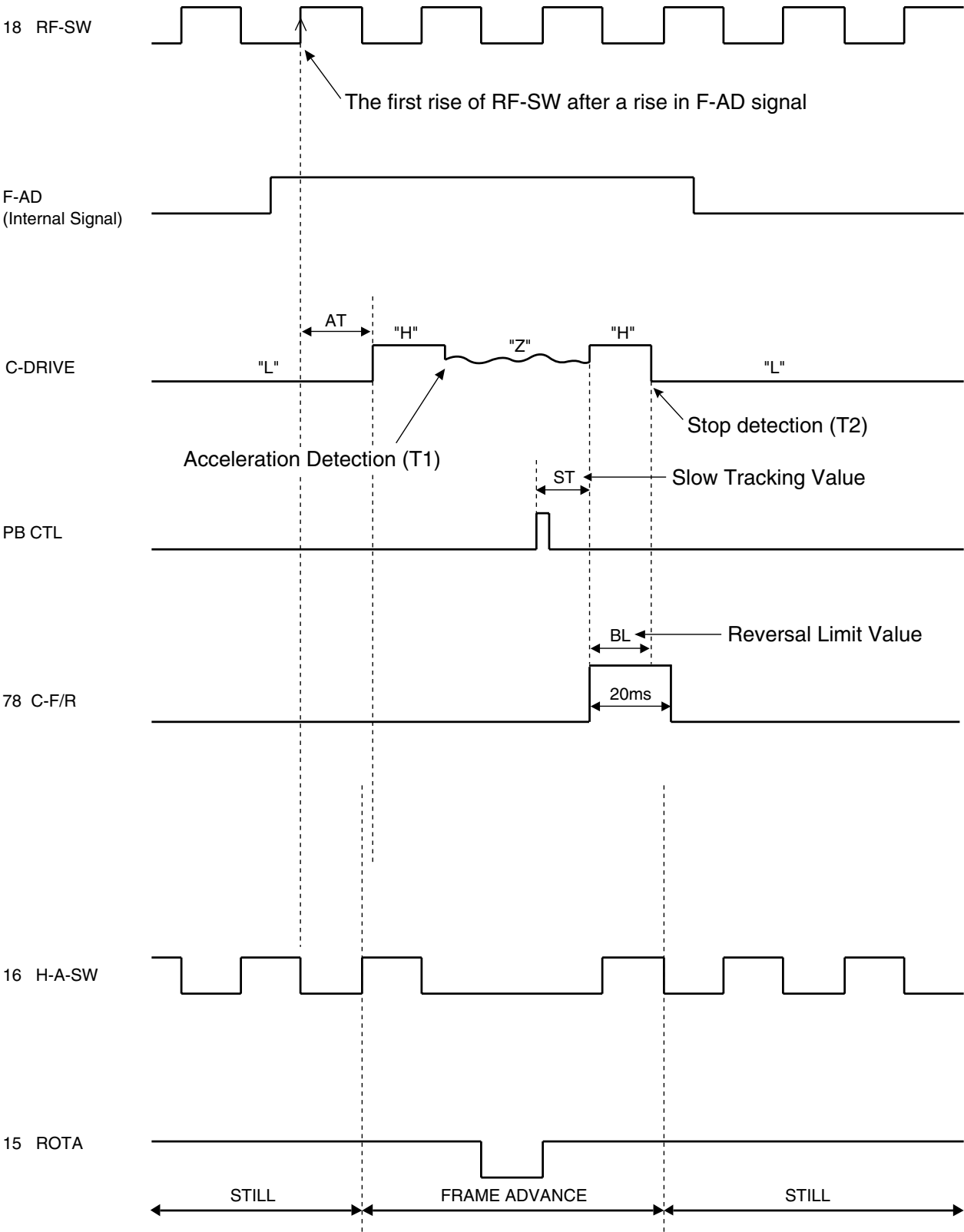


Fig. 1

2) LP Mode

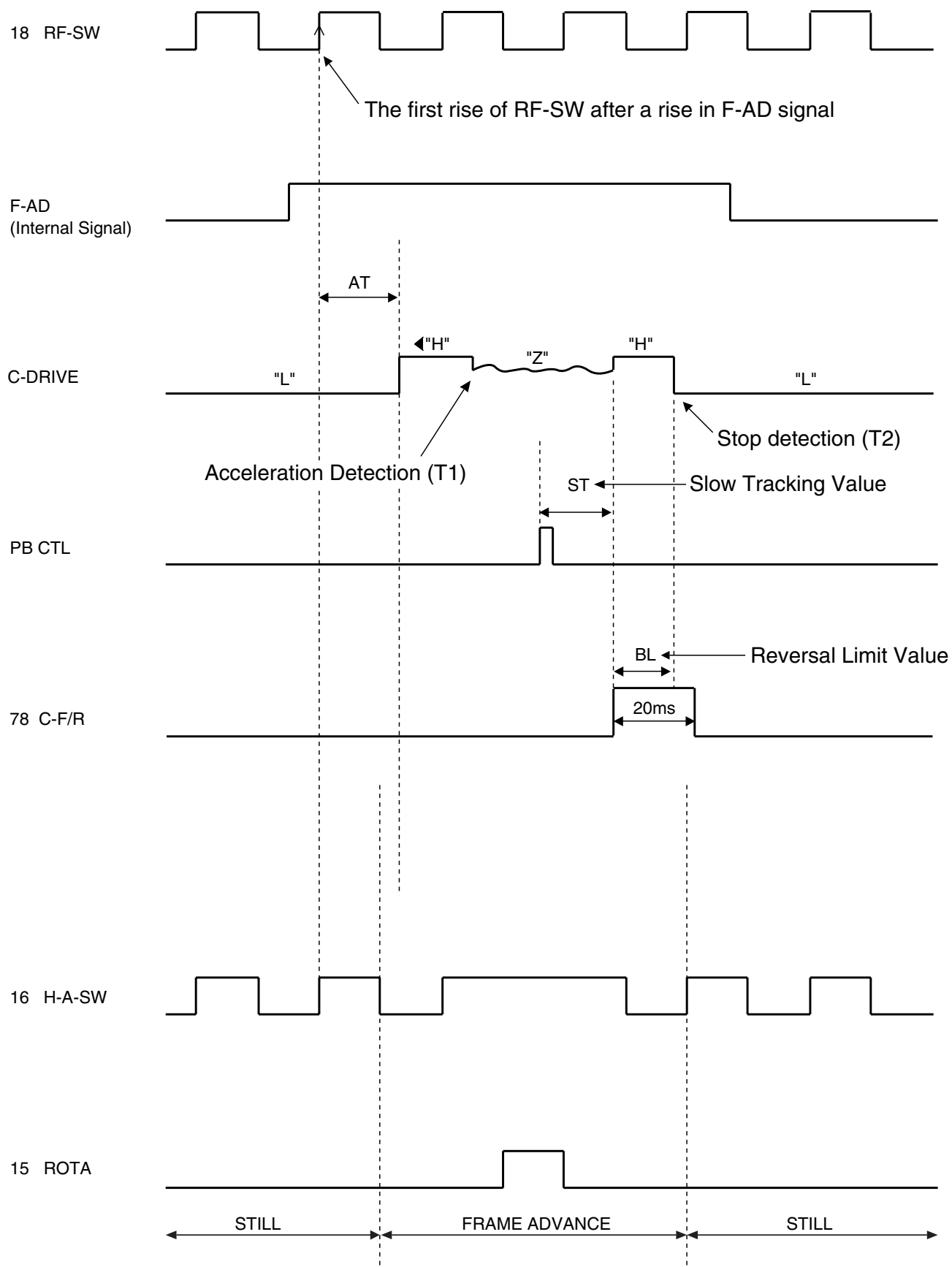


Fig. 2

1. EJECT (POWER OFF) -> CASSETTE IN (POWER ON) -> STOP(B) -> STOP(A) -> PLAY -> RS -> FS -> PLAY -> STILL -> PLAY -> STOP(A)

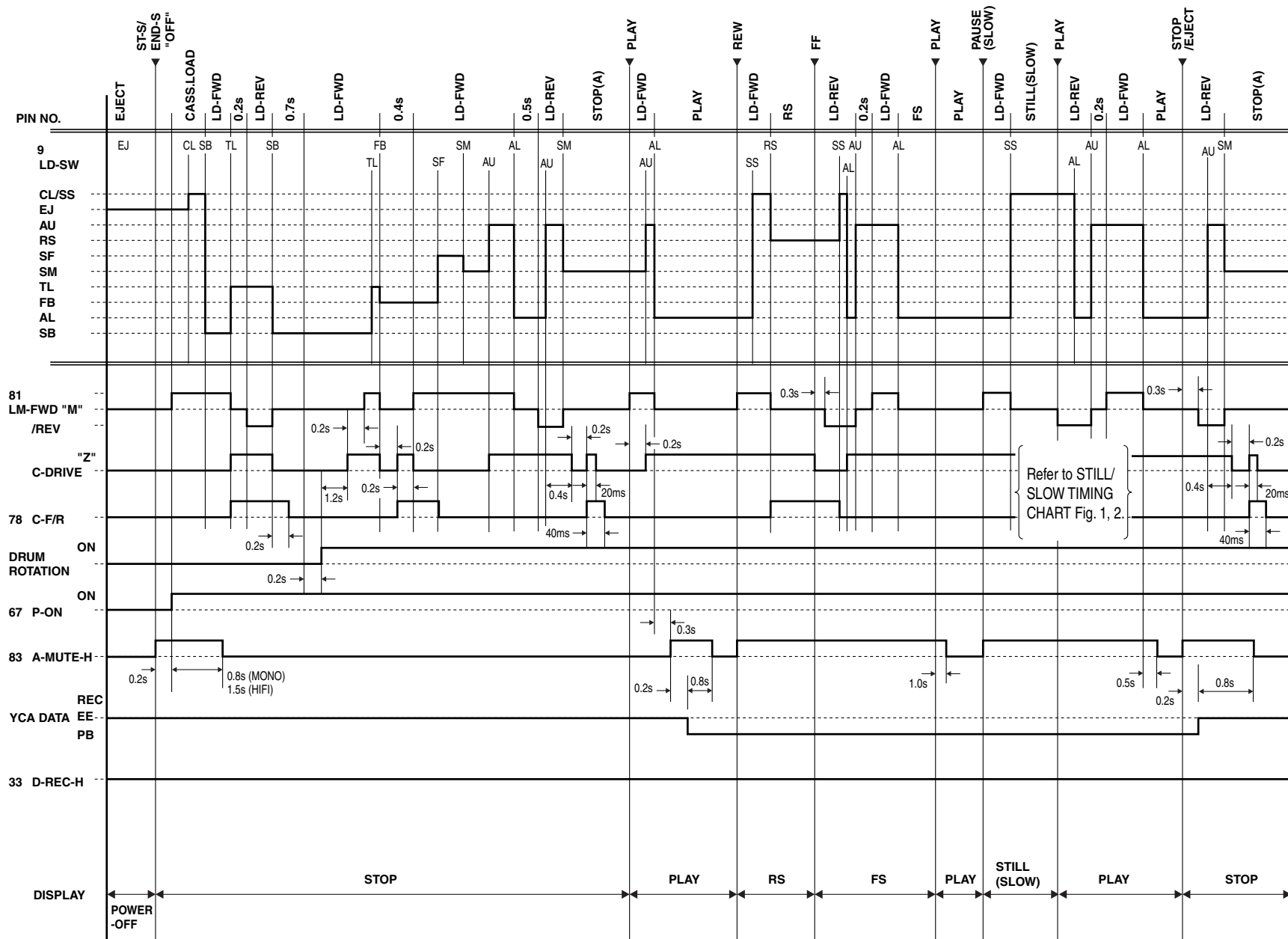


Fig. 3

2. STOP(A) -> FF -> STOP(A) -> REW -> STOP(A) -> REC -> PAUSE -> PAUSE or REC -> STOP(A) -> EJECT

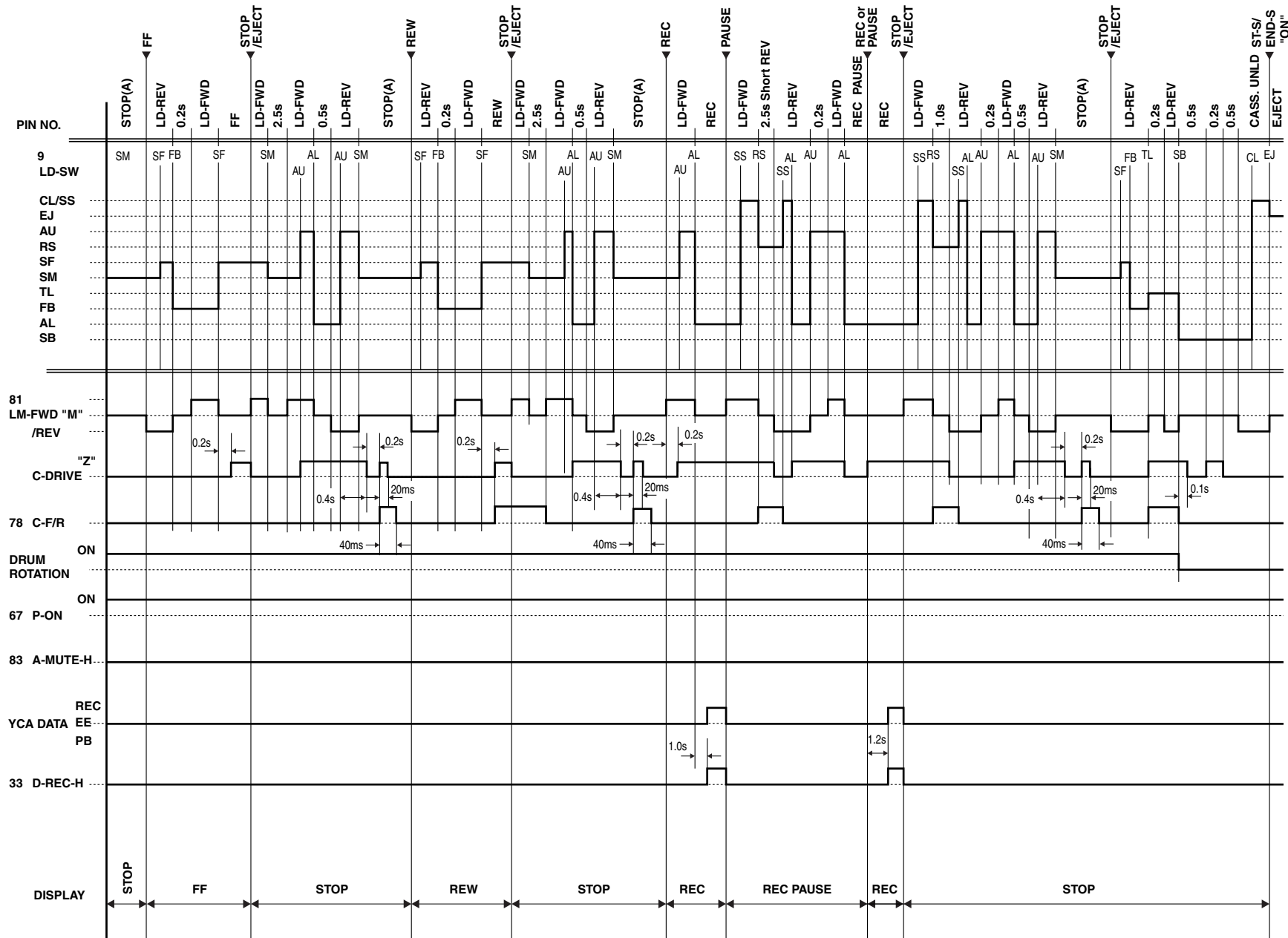


Fig. 4

[VT-MX310E(UK)]



2. STOP(A) -> FF -> STOP(A) -> REW -> STOP(A) -> REC -> PAUSE -> PAUSE or REC -> STOP(A) -> EJECT

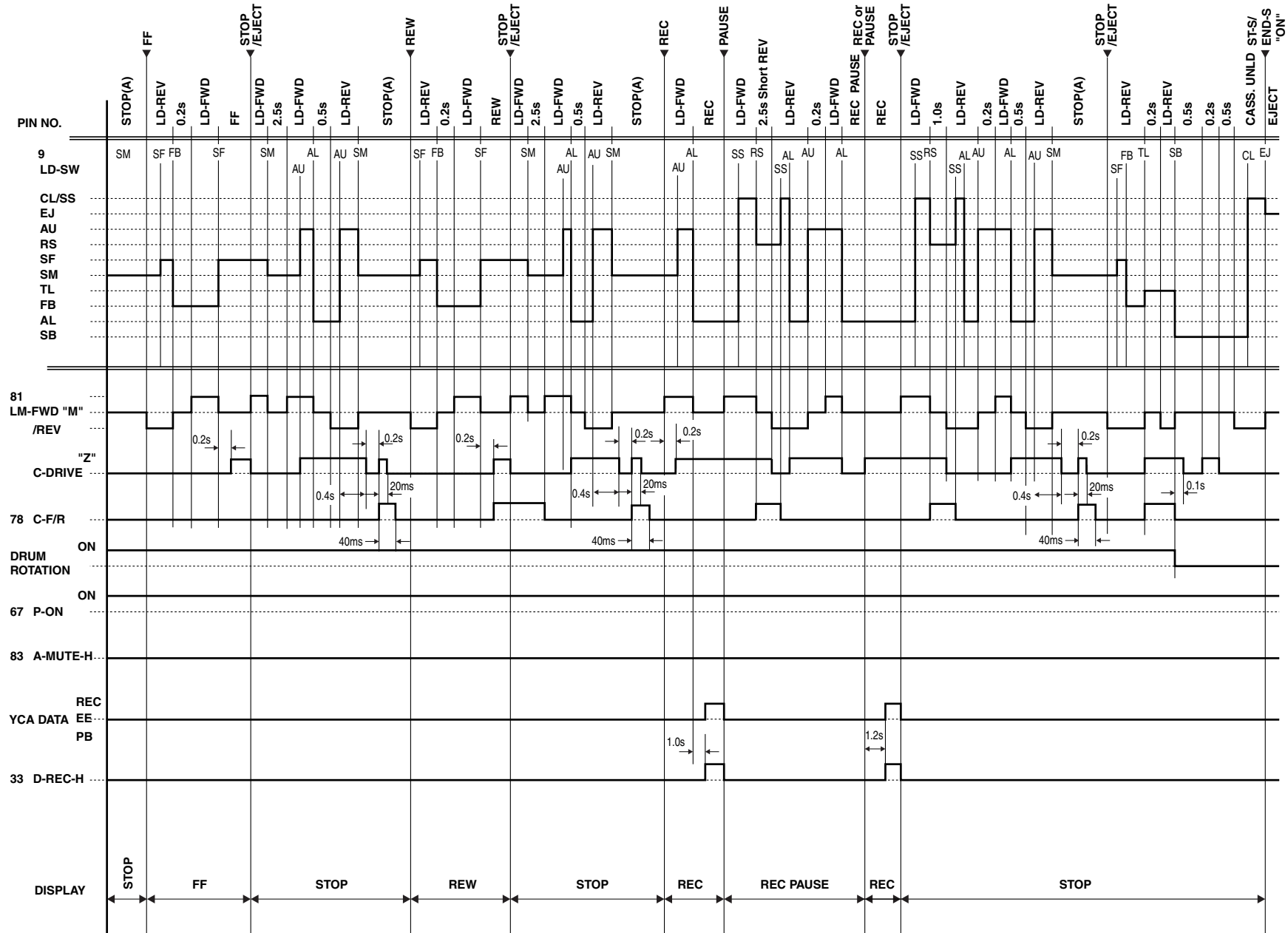


Fig. 6

8 IC PIN FUNCTION DESCRIPTIONS

Comparison Chart of Models and Marks

Model	Mark
VT-FX340E(UK)	A
VT-MX310E(UK)	B

IC501(SERVO / SYSTEM CONTROL IC)

“H” ≥ 4.5V, “L” ≤ 1.0V

Pin No.	Mark	IN/ OUT	Signal Name	Function	Active Level
1		IN	SC2-IN	Input Signal from Pin 8 of SCART2	A/D
2		IN	PG-DELAY	Video Head Switching Pulse Signal Adjusted Voltage	A/D
3		IN	POW-SAF	P-ON Power Detection Input Signal	A/D
4		IN	END-S	Tape End Position Detect Signal	A/D
5		IN	AFC	Automatic Frequency Control Signal	A/D
6		IN	V-ENV	Video Envelope Comparator Signal	A/D
7		IN	KEY-1	Key Scan Input Signal 1	A/D
8		IN	KEY-2	Key Scan Input Signal 2	A/D
9		IN	LD-SW	Deck Mode Position Detector Signal	A/D
10		OUT	ST-S	Tape Start Position Detector Signal	A/D
11		-	NU	Not Used	-
12		-	NU	Not Used	-
13		OUT	D-V- SYNC	Dummy V-sync Output	H/ Hi-z
14		IN	REMOCON-IN	Remote Control Sensor	L
15		OUT	C-ROTA	Color Phase Rotary Changeover Signal	H/L

Pin No.	Mark	IN/ OUT	Signal Name	Function	Active Level
16	B	-	NU	Not Used	-
	A	OUT	H-A-SW	Video Head Amp Switching Pulse	H/L
17	B	-	NU	Not Used	-
	A	IN	H-A-COMP	Head Amp Comparator Signal	H/L
18		OUT	RF-SW	Video Head Switching Pulse	H/L
19	B	-	NU	Not Used	-
	A	OUT	HiFi-H-SW	HiFi Audio Head Switching Pulse	H/L
20		IN	DAVN-L	VPS/PDC Data Receive = “L”	L
21		-	NU	Not Used	-
22		-	NU	Not Used	-
23		-	NU	Not Used	-
24		-	NU	Not Used	-
25		-	NU	Not Used	-
26		-	NU	Not Used	-
27		-	NU	Not Used	-
28	B	-	NU	Not Used	-
	A	OUT	LINE MUTE	Audio Mute Control Signal	L
29	B	OUT	AUDIO-SW-1	Audio IN/OUT Control Signal	H/L
	A	-	NU	Not Used	-
30	B	OUT	AUDIO-SW-2	Audio IN/OUT Control Signal	H/L
	A	-	NU	Not Used	-
31		IN	REC-SAF-SW	Recording Safety SW Detect (With Record tab="L"/ With out Record tab="H")	H
32	B	-	NU	Not Used	-
	A	IN	A-MODE	Hi-Fi Tape Detection Signal	L
33		OUT	D-REC-H	Delayed Record Signal	L
34		IN	RESET	System Reset Signal (Reset="L")	L
35		IN	Xcin	Sub Clock	-

Pin No.	Mark	IN/ OUT	Signal Name	Function	Active Level
36		OUT	Xcout	Sub Clock	-
37		-	Vcc	Vcc	-
38		IN	Xin	Main Clock Input	-
39		OUT	Xout	Main Clock Input	-
40		-	Vss	Vss(GND)	-
41		-	NU	Not Used	-
42		-	NU	Not Used	-
43		IN	CLKSEL	Clock Select (GND)	L
44		IN	OSCIN	Clock Input for letter size	-
45		OUT	OSCOU	Clock Output for letter size	-
46		-	NUB	Not Used	-
47		-	LP	LP	-
48		IN	FSC-IN [4.43MHz]	4.43MHz Clock Input	-
49		-	OSDVss	OSDVss	-
50		IN	OSD-V-IN	OSD Video Signal Input	L
51		-	NU	Not Used	-
52		OUT	OSD-V-OUT	OSD Video Signal Output	L
53		-	OSDVcc	OSDVcc	-
54		-	HLF	LPF Connected Terminal (Slicer)	-
55		-	NU	Not Used	-
56		-	NU	Not Used	-
57		-	NU	Not Used	-
58		IN	C-SYNC	Composite Synchronized Pulse	PUL SE
59		OUT	8POUT-1	SCART 1 8Pin Output Control Signal	H/L
60		-	NU	Not Used	-
61		-	NU	Not Used	-
62		-	NU	Not Used	-
63		-	NU	Not Used	-
64		-	NU	Not Used	-
65		-	NU	Not Used	-
66		OUT	C-POWER-SW	Capstan Power Switching Signal	H/L
67		IN	P-ON-H	Power On Signal at High	H

Pin No.	Mark	IN/ OUT	Signal Name	Function	Active Level
68		OUT	DRV-DATA	LED Clock Driver IC Control Data	H/L
69		OUT	DRV-STB	LED Clock Driver IC Chip Select Signal	H/L
70		OUT	DRV-CLK	LED Clock Driver IC Control Clock	H/L
71		OUT	IIC BUS-SCL	I ² C BUS Control Clock	H/L
72		IN/ OUT	IIC BUS-SDA	I ² C BUS Control Data	H/L
73		OUT	P-OFF-H	Power Off at High	L
74		-	NU	Not Used	-
75		-	NU	Not Used	-
76		OUT	C-CONT	Capstan Motor Control Signal	PWM
77		OUT	D-CONT	Drum Motor Control Signal	PWM
78		OUT	C-F/R	Capstan Motor FWD/REV Control Signal (FWD="L"/REV="H")	H/L
79		IN	S-REEL	Supply Reel Rotation Signal	PUL SE
80		IN	T-REEL	Take Up Reel Rotation Signal	PUL SE
81		OUT	LM-FWD/REV	Loading Motor Control Signal	H/L/Hi-z
82		-	NU	Not Used	-
83		OUT	A-MUTE-H	Audio Mute Control Signal (Mute = "H")	H
84		OUT	FF/REW-L	CTL Amp Gain Switching Signal (FF/REW="L")	L
85		-	NU	Not Used	-
86		IN	P-DOWN-L	Power Voltage Down Detector Signal	L
87		IN	C-FG	Capstan Motor Rotation Detection Pulse	PUL SE
88		-	NU	Not Used	-
89		-	NU	Not Used	-
90		IN	D-PFG	Drum Motor Pulse Generator	PUL SE

Pin No.	Mark	IN/ OUT	Signal Name	Function	Active Level
91		-	AMPVREF OUT	V-Ref for CTL AMP	-
92		-	AMPVREFin	V-Ref for CTL AMP	-
93		-	P80/C	P80/C Terminal	-
94		OUT	CTL -	Playback/ Record Control Signal (-)	H/L
95		OUT	CTL +	Playback/ Record Control Signal (+)	H/L
96		-	AMPC	CTL AMP Connected Terminal	-
97		-	CTLAMPout	To Monitor for CTL AMP Output	PULSE
98		-	AMPVcc	AMPVcc	-
99		-	AVcc	A/D Converter Power Input/ Standard Voltage Input	-
100		IN	AGC	Tuner IF Output Signal	A/D

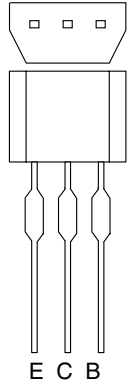
Notes:

Abbreviation for Active Level:

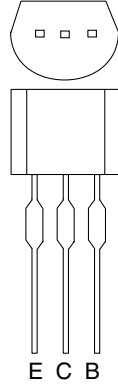
PWM -----Pulse Wide Modulation

A/D-----Analog - Digital Converter

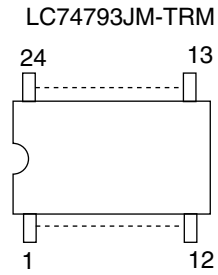
9 LEAD IDENTIFICATIONS



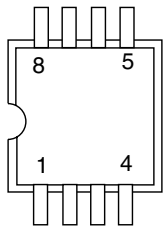
BN1L4M-T
BN1F4M-T
BA1F4M-T
KTA1266(GR)
KTC3199(Y,GR,BL)
2SC2785(J.H.F.K)
KRA103M
KRC103M
KTA1281(Y)



2SC1815-Y(TPE2)
2SC1815-GR(TPE2)
2SC3266-Y (TPE2)
2SC2120-Y(TPE2)
KTC3203(Y)
2SC1815-BL(TPE2)
2SA1020(Y)
KTC3205(Y)
2SA1015-GR(TPE2)



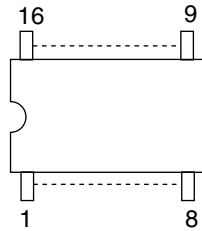
BR24C02F-W
CAT24WC02JI



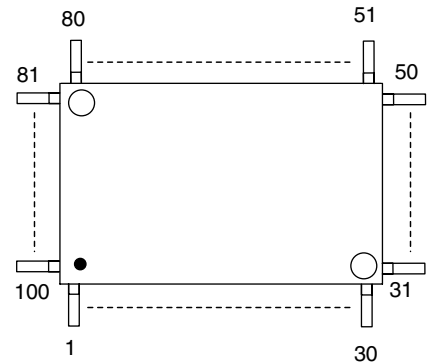
LTV-817(B,C)-F



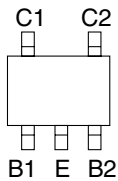
BU4052BCF-E2
TC4053BF(N)
CD4053BCSJX



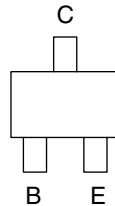
QSZAB0RMB168
LA71750AM-MTB



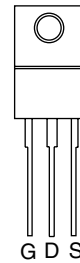
RN1511(TE85R)
FMG4A T148



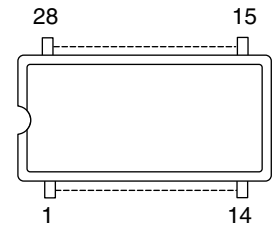
KTA1504GR-RTK
KTA1504Y-RTK
KTC3875Y-RTK
KRC103SRTK



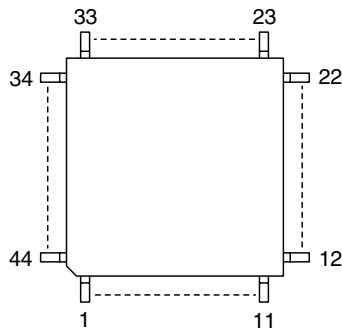
2SK3566



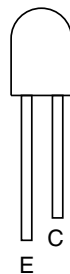
PT-6958-FN-TP



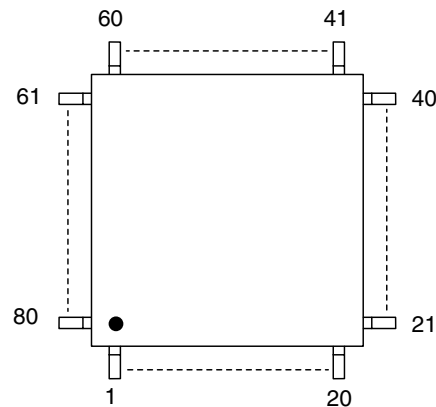
MSP3417G-QG-B8
MSP3417G-QG-B8-V3



PT204-6B-12
MID-32A22



LA72648M



Note:

A: Anode
K: Cathode
E: Emitter
C: Collector
B: Base
R: Reference
S: Source
G: Gate
D: Drain

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